

**COMMERCE ACT 1986: BUSINESS ACQUISITION SECTION 66: NOTICE SEEKING  
CLEARANCE**

4 July 2011

The Registrar  
Business Acquisitions and Authorisations  
Commerce Commission  
PO Box 2351  
WELLINGTON

Pursuant to s66(1) of the Commerce Act 1986 notice is hereby given seeking **clearance** of a proposed business acquisition.

## 1. SUMMARY OF APPLICATION

- 1.1 This application relates to the proposed acquisition by Seagate Technology PLC ("**Seagate**"), directly or indirectly, of certain assets of the hard disk drive ("**HDD**") business of Samsung Electronics Co., Ltd ("**Samsung**") pursuant to an Asset Purchase Agreement dated 19 April 2011 ("**Acquisition**").
- 1.2 The assets of Samsung's HDD business to be acquired consist of certain equipment and other tangible and intangible assets used exclusively by Samsung in research and development, manufacture and sale of HDDs which are owned or leased by Samsung. The remainder of Samsung's business, including its solid state drive ("**SSD**") business, will continue to operate independently post-acquisition.
- 1.3 The Acquisition is taking place globally. The manufacture and supply of HDDs takes place on a global scale, and neither Seagate nor Samsung have a direct presence in New Zealand.
- 1.4 Seagate is active worldwide in the design, manufacture and marketing of a broad range of computer storage devices, consisting mostly of HDDs and Hybrid HDDs for sale for mobile, enterprise, desktop and consumer electronics end-uses. Seagate also produces thin-film recording media and read / write heads that are for captive use in its HDDs.
- 1.5 The HDD business of Samsung designs, manufactures, markets and sells HDDs on a worldwide basis to original equipment manufacturers ("**OEM**") and original design manufacturers ("**ODM**"), for use in computer systems, subsystems or consumer electronic devices, and to distributors, resellers and retailers.
- 1.6 New technologies and product innovation have a significant influence on the data storage industry. The consumer trend toward mobile end uses (particularly tablets and smartphones), the advent of SSDs, and the growing popularity of cloud computing has significantly changed the competitive dynamic and are the driving force of consolidation in the market for HDDs.
- 1.7 The proposed Acquisition will not result in a substantial lessening of competition in any market in New Zealand for the following reasons:
- (a) The market for the supply of HDDs is extremely competitive. The merged entity will be constrained by existing competitors, namely Western Digital (who have entered into an agreement to acquire the HDD business of Hitachi) and Toshiba. Both Western Digital and Toshiba are established, multinational, vertically integrated technology businesses. They each have substantial resources and will continue to exercise a significant degree of constraint on the merged entity.
  - (b) Barriers to expansion by existing operators are low. The HDD market is characterised by high excess capacity, and manufacturers can quickly and easily increase output without incurring substantial additional costs. While there are some barriers to greenfields entry, there are a number of potential entrants that could enter the market in the short to medium term. In particular, major HDD purchasers (OEMs such as HP and Dell) have the resources to self-supply or "sponsor" new entry, and ODMs (themselves contract manufacturers of HDDs) could easily commence supply of HDDs in the short term given their familiarity with the industry, significant resources, and ready access to inputs and intellectual property.

## Public version

- (c) The major purchasers of HDDs consist of the worlds largest OEMs and distributors. These purchasers are large, sophisticated businesses with significant countervailing power, evidenced by multi-sourcing policies and short term (in some cases quarterly) supply contracts. Purchasers are highly price sensitive and quality of product offering and reliable time-to-market is critical for securing ongoing business. Regular customer switching is a feature of the market, particularly among major purchasers.
- (d) There is significant constraint from other forms of storage. As noted earlier, the global digital storage industry is currently facing vigorous competition from new storage technologies, namely SSDs and the cloud computing phenomenon, which have the potential to replace HDDs in relation to an increasing number of applications. Trends in the New Zealand digital storage industry are dictated by global developments.
- (e) The merger will generate efficiencies, which will flow through by way of cost savings for consumers and an increasing ability to meet changing consumer demands. [  
  
] This will allow the merged entity to be more efficient and compete more vigorously with the global market leader, Western Digital (especially if it acquires Hitachi, as it is expected to do).
- (f) The vast majority of HDDs are sold to offshore manufacturers of desktop computers, laptops and consumer electronics. HDDs sold direct to consumers are sold through distributors, on a non-exclusive basis. This limits the effect of the acquisition in New Zealand markets.

1.8 Accordingly, the proposed Acquisition is not likely to substantially lessen competition in any market in New Zealand.

**PART 1: TRANSACTION DETAILS****1. Provide the name of the acquirer (person giving notice), and the name and position of the individual responsible for the notice.****1.1 This notice is given by Seagate Technology PLC ("**Seagate**" or the "**Applicant**"):**

Seagate Technology Public Limited Company  
 Arthur Cox Building  
 Earlsfort Terrace  
 Dublin 2  
**IRELAND**

Attention: Kenneth M. Massaroni  
 Position: General Counsel  
 Address: Seagate Technology plc  
 10200 S. De Anza Blvd  
 Cupertino, CA 95014  
 Telephone: [  
 Fax:  
 Email: ]

**1.2 All correspondence and notices in respect of the application be directed in the first instance to:**

Russell McVeagh  
 Barristers & Solicitors  
 PO Box 8  
**AUCKLAND 1140**

Attention: Andrew Peterson, Partner / Chris Bowden, Senior Solicitor  
 Telephone: 09 367 8315 / 09 367 8862  
 Fax: 09 367 8595  
 Email: andrew.peterson@russellmcveagh.com /  
 chris.bowden@russellmcveagh.com

**2. Provide the name of the other merger parties, and the name/position of the relevant individual within the relevant merger parties.****2.1 The other merger party is Samsung Electronics Co., Ltd ("**Samsung**").**

## 2.2 Contact details are as follows:

Samsung Electronics Co., Ltd  
 1320-10 Seocho 2-dong, Seocho-gu  
 Seoul  
**REPUBLIC OF KOREA**  
**137-857**

HDD Place of Business:

416, Maetan 3-dong, Yeongtong-du  
 Suwon City  
**REPUBLIC OF KOREA**  
**433-742**

Attention: Kyu Sung Lee  
 Position: Vice President  
 Address: Samsung Electronics Co. Ltd.  
 1320-10 Seocho 2-dong, Seocho-gu  
 Seoul, Republic of Korea  
 137-857  
 Telephone: [  
 Fax:  
 Email: ]

## 2.3 All correspondence and notices in respect of the application be directed in the first instance to:

Paul, Hastings, Janofsky & Walker (Europe) LLP  
 Attorneys  
 Avenue Louise 480 - 5B  
 1050 **BRUSSELS**

Attention: Pierre Kirch, Partner  
 Telephone: +32 2 641 7464  
 Fax: +33 1 78 40 46 23  
 Email: [pierrekirch@paulhastings.com](mailto:pierrekirch@paulhastings.com)

**3. With respect to the merger parties, list the relevant companies and the person or persons controlling these directly or indirectly. Please use organisational charts or diagrams to show the structure of the ownership and control of the acquirer and participant(s) to the acquisition.**

**Seagate**

**3.1 Attached as **Seagate Confidential Appendix A** is an organisational chart for the Seagate group of companies, together with a list of the entities and their purpose.**

**3.2 Seagate is domiciled in Ireland and is active worldwide in the design, manufacture and marketing of a broad range of computer storage devices, consisting mostly of Hard Disk Drive ("HDDs") and Hybrid Hard Disk Drives ("H-HDDs") for sale for mobile, enterprise, desktop and consumer electronic devices. Nearly all of Seagate's sales into New Zealand [**

**]**

### Samsung Electronics

3.3 The HDD business of Samsung designs, manufactures, markets and sells HDDs on a worldwide basis, for use in computer systems, subsystems and consumer electronic devices, and to distributors, resellers and retailers. Attached as **Samsung Confidential Appendix B** is a list of relevant Samsung entities.

3.4 Samsung is domiciled in the Republic of Korea. The HDD business of Samsung designs, manufactures, markets and sells HDDs on a worldwide basis to original equipment manufacturers ("**OEMs**") and original design manufacturers ("**ODMs**"), for use in computer systems, subsystems or consumer electronic devices, and to distributors, resellers and retailers. It also manufactures HDD for captive supply to its OEM business.

3.5 [ ]

### Links between the merger parties

3.6 Seagate supplies Samsung with some of its HDD requirements for use in computers and consumer electronics products manufactured by Samsung.

3.7 [ ]

### 4. Provide details on what is to be acquired

4.1 Seagate seeks clearance to acquire, directly or indirectly, certain assets of the HDD business of Samsung as described in the Agreement for Sale and Purchase between Seagate and Samsung ("**the Acquisition**").

4.2 The Acquisition will be carried out by Seagate Technology International ("**Seagate Technology**"), an indirectly wholly owned subsidiary of Seagate. Under the terms of the Asset Purchase Agreement (copy attached at **Confidential Appendix C**) [ ]

4.3 Simultaneously upon execution of the Asset Purchase Agreement, [ ]

4.4 [ ]

**5. Fully explain the commercial rationale for the proposed merger. Specify whether this is part of an international merger.**

**International nature of the transaction**

5.1 The Acquisition is taking place globally, between two companies operating in a global marketplace. No part of the transaction will take place in New Zealand, and there is no separate transaction or separately identified assets relating to the New Zealand HDD business of Samsung.

5.2 Despite the global nature of the market, section 4(3) of the Commerce Act ("Act") recognises that section 47 of the Act will apply to mergers that occur outside New Zealand, by a person (whether or not the person is resident or carries on business in New Zealand) of the assets of a business to the extent that the acquisition affects a market in New Zealand.

5.3 Although, for the reasons set out below, the Acquisition is not likely to substantially lessen competition in any market in New Zealand, there is the potential for the Acquisition to affect the sale of HDDs in New Zealand, consistent with section 4(3) of the Act. In particular, Seagate sells goods directly to New Zealand customers, so the Acquisition will remove Samsung as an alternative source of HDDs for sale in New Zealand for these Seagate customers. [

]. Samsung's HDDs are therefore sold in New Zealand.<sup>1</sup> Given this, the merger has the potential to affect both retail sales and wholesale supply of HDDs in New Zealand.

5.4 Finally, HDDs are a component of a number of computer and consumer electronic products sold in New Zealand, accounting for approximately [ ] of the overall cost of these products. Therefore, the merger has the potential to indirectly affect these downstream retail markets in New Zealand.

**Seagate's rationale**

5.5 The Acquisition represents a critical opportunity for Seagate to continue ongoing development of its broad line of HDD product offerings whilst realising significant efficiencies. [

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5.6 Through the Acquisition, [

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<sup>1</sup> See, for example, <http://pconlineshop.co.nz/>, <http://www.computerstore.co.nz/> and <http://www.playtech.co.nz/>.

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**Samsung's Rationale**

5.7 Samsung is the smallest competitor in the overall HDD market as well as in most end-uses and form factors of the HDD industry and in some areas has no or only a miniscule presence (e.g., consumer electronics and enterprise).

5.8 Seagate is not aware of Samsung's rationale for the sale of its HDD assets. [

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5.9 [

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**6. Provide copies of the final or most recent versions of any document bringing about the proposed merger.**

6.1 The relevant transaction documentation is enclosed at **Confidential Appendix C**.

**7. If any other jurisdiction's competition agency has been (or will be) notified of the proposed merger, please list each competition agency notified (or to be notified) and the date of the notification.**

7.1 The acquisition is part of an international merger, and regulatory approval has been or will be sought in the following jurisdictions (unless otherwise stated, the filing was submitted on 19 May 2011):<sup>2</sup>

(a) [

(b) ];

(c) Japan;

(d) [

(e)

(f)

(g)

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<sup>2</sup> [

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- (h) ];
- (i) United States of America (filing submitted on 19 April 2011) (the FTC has made a 'second request' in respect of the Acquisition); and
- (j) the European Union (filing submitted on 19 April 2011) (the European Commission is currently conducting a Phase II investigation, with a decision due on 26 October 2011).

7.2 Seagate will continue to update the Commission on the progress of these investigations.

## **PART 2: THE INDUSTRY**

8. **Describe the relevant goods or services supplied by the merger parties (it is sufficient to refer in general terms to activities in which there will be no aggregation).**

### **HDDs**

8.1 The HDD industry dates back over 50 years, with HDDs initially being used in business-orientated storage systems before expanding – with the growth of personal computing – into desktop applications. They were integrated into most PCs as a standard feature by 1990, and in the early 1990s began to be used in mobile computing applications, as laptop computers began to gain traction in computing markets. Since then, they have been incorporated into a growing range of consumer electronics items. The move towards mobility has changed the purchasing requirements of OEMs and introduced new competitive dynamics to the HDD market as consumers have rapidly adopted netbooks, tablets and smartphones as a primary and, in increasing numbers, sole, source of computing. Manufacturers of some mobile devices have exhibited a preference for SSDs over HDDs, due to their size, shock resistance and power consumption properties. For example, Seagate understands that Apple only uses SSDs in its iPad and iPhone devices.

### **Overview of the components of HDDs**

8.2 HDDs are data storage systems that store digitally encoded data on rapidly rotating disks with magnetic surfaces. The information is written and read by read/ write heads positioned over the disks. Every HDD contains one or more disks with a corresponding number of heads per disk and, in some cases, two heads per disk (one for each side). The disks are composed of two main substances: a substrate material (the "**platter**") that forms the bulk of the disk and gives it structure and rigidity, and a magnetic media coating ("**media**") which actually holds the magnetic impulses that represent the data.

8.3 The individual components of an HDD are explained in more detail at **Appendix D**.

### **Overview of the relevant characteristics of HDDs**

8.4 There are four main characteristics of HDDs: form factor, rotational speed, interface, and capacity:

- (a) **Form factor** refers to the size of the HDD. There are three form factors prevalent in the HDD market today; 1.8", 2.5" and 3.5" HDDs. The form factor is determined by the size of the data recording platter. As technology has advanced, HDD manufacturers have been able to produce HDDs with greater

capacity relative to form factor. Accordingly, HDDs with a form factor of greater than 3.5" no longer feature in the market.

- (b) **Rotational speeds** indicate the speed at which the platters within the HDD rotate and are measured in revolutions per minute (rpm). A high rpm will enable a faster seek time for accessing data, whereas a lower rpm will contribute to less noise, heat and power consumption.
- (c) **Interfaces** enable data within HDDs to be accessed. HDD interfaces have been defined as industry standards (to enable full interoperability across a range of different end uses) and currently include Serial Advanced Technology Attachment (SATA), serial attached SCSI (SAS) and Fibre Channel (FC). Legacy interfaces are Parallel Advanced Technology Attachment (PATA).
- (d) **Capacity** refers to the amount of data that can be stored on the HDD platter, and is measured in gigabytes (GB) or terabytes (TB). Again, HDD capacities have increased exponentially in line with advancements in the areal density of the HDD platters (areal density refers to the amount of data that can be stored relative to the surface area of the platter).

### End-uses of HDDs

- 8.5 HDDs are used in a variety of different applications. These applications are generally grouped into the following end-use categories: Desktop Computing, Notebook, Consumer Electronic, and Enterprise.

#### *Desktop Computing*

- 8.6 Desktop computers are usually characterized as computers for fixed use, normally at a desk or other workstation. Desktops generally include a display, input devices (keyboard, mouse, etc.), speakers, and a case with the core computer components (i.e., motherboard, processor, memory, storage, etc.). Desktop applications for HDDs include their use as primary storage drives (i.e., boot drives) or secondary storage drives, such as for external back up or bulk file storage.
- 8.7 HDDs that currently are used in desktop applications include 3.5" SATA 5,400/7,200/10,000 rpm drives and a 2.5" SATA 5,400/7,200 rpm drives, at a range of capacities.

#### *Notebook*

- 8.8 A notebook, also commonly referred to as a laptop, is a personal computer that is designed for mobile use. Notebooks typically have the same components of a desktop computer, including a keyboard, display screen and speakers. Unlike desktops, notebooks are portable and can be taken anywhere. While notebook computers were originally developed for a smaller niche market (e.g., portable devices for job sites), they have become increasingly popular and even more widely used than their desktop counterparts. Notebooks outsold desktops for the first time at the end of 2008. The ever increasing move towards notebooks is likely to continue to impact the competitive dynamics of the HDD market.
- 8.9 The move toward mobility has changed the HDD purchasing requirements of OEMs, and has introduced a new set of competitive forces to the market. Customers have rapidly adopted netbooks, tablets and smartphones as their primary, and in increasing numbers, only, source of computing. Seagate predicts that new users entering the market, particularly in emerging countries, will skip the PC and go straight to the

smartphone because emerging countries realise a more palatable initial infrastructure investment in wireless.

- 8.10 Portable platforms such as notebooks, smartphones, and electronic book readers (eReaders) are growing in use at very impressive rates, and for these applications SSDs offer new flexibility in product design and user experience in terms of form factor, power and environmental attributes. Tablets exclusively use embedded flash as a storage medium, as do smartphones and eReaders, which in turn, has led Seagate [ ]
- 8.11 Seagate projects that the trend toward mobility has also altered the views of customers as to where storage should be maintained. Thus, customers are increasingly looking at whether devices should have a low local storage capacity model, whereby a desktop or a notebook only contains a small SSD or HDD, and maintains the remainder of the capacity in the cloud, where it will be centrally stored. These developments are discussed later in the application.
- 8.12 The HDDs currently used in notebook applications include 2.5" drives, with rotational speeds of 5,400 or 7,200 rpm, SATA or PATA interfaces and between 80 GB and 500 GB of capacity.

#### *Consumer Electronics*

- 8.13 With the rising demand for immediate digital information and entertainment, today's consumer electronics devices need robust digital storage to house movies, music, video games, maps, and more. Consumer electronics HDDs provide the basic support for many of the mobile devices that people consider essential to their everyday life – digital music players, digital video cameras, and mobile phones. These HDDs also provide the necessary memory for larger products as well, including video game systems, digital video recorders ("DVRs"), and automotive navigation systems.
- 8.14 As indicated above, Seagate projects that the trend toward mobility has altered the views of customers as to where storage should be maintained. For example, industry analysts project that over the next 3-5 years, DVRs will become diskless, using only a small amount of flash memory for buffering. The remainder of the content will be stored in the cloud, and streamed – either over the Internet, or through proprietary Content Delivery Networks, such as Akami. The same is true for netbooks, smartphones and MP3 players, which – with the increase in popularity of streaming music – rely on small caches of local memory and on content stored in remote data centres (in the "cloud") to maintain most of the stored material.
- 8.15 HDDs that are currently used in CE applications range from 1.8" to 3.5" drives, SATA, PATA and ATA interfaces, and various rotational speeds and capacities.

#### *Branded external HDDs*

- 8.16 Some consumer electronics devices use branded external HDDs. As recently as 2007, market analysts included these products in their review of desktops. Increasing sales over the past three years, driven primarily by consumer demand for additional means to store and protect their digital data, have made it clear that branded external HDDs are used for a number of different end-uses.
- 8.17 Branded external HDDs almost always are purchased directly by end consumers. As personal materials like music, pictures, movies, and private documents have moved from physical formats to digital formats, consumer needs for increased storage

capabilities have grown. Typically, consumers purchase external HDDs for one of two reasons:

- (a) First, to supplement the storage capabilities of their desktop, laptop, or netbook. As the built-in storage provided with these machines is filled, the machine tends to run slowly and less efficiently. Transferring large amounts of data – such as digital pictures or digital music – to an external HDD relieves many of the system’s constraints and allows the user to continue using the machine rather than requiring that they purchase a new system with increased storage capabilities; and
- (b) Second, to back up their machine’s internal hard drive in case of system failure or file corruption.

8.18 External HDDs are available in three form factors: 3.5", 2.5" or 1.8". The three models have different requirements and provide customers with varying degrees of storage capabilities.

#### *Enterprise*

8.19 The nature of enterprise data storage has changed over the last ten years. In the late 1990s, enterprise data was largely transactional, requiring a large proportion of high-performance drives to provide the real-time, around-the-clock performance levels required. However, as the quantity and types of data, including data stored to meet corporate, data retention and other regulatory obligations, has grown rapidly during the course of this decade, new storage solutions have developed that more efficiently store, and provide a diverse array of cost and performance solutions for, the many different types of data. As a result, the enterprise environment today is more heterogeneous than it was a few years ago, with a wider variety of HDD types being deployed in enterprise applications. This evolution reflects the diverse uses, the high degree of innovation and the short product life cycles identified by the European Commission over 15 years ago in *Seagate/ Conner*<sup>3</sup> and *IBM/ Hitachi Harddisk Business*,<sup>4</sup> and more recently in *Seagate/ Maxtor*<sup>5</sup> and *Toshiba/ Fujitsu*<sup>6</sup>.

8.20 Enterprise-grade data storage solutions today include a host of end-use applications. As enterprise end-uses have proliferated and evolved, so have the types and capabilities of HDDs required to support these applications. In particular, today’s HDDs, with their broader range of interfaces, including HDDs using FC, SCSI, and SAS interfaces (and, occasionally, for low-performance, low-use applications, even the SATA and PATA interfaces) are suitable for enterprise-grade storage.

8.21 For end-users, the choice of enterprise-grade storage solutions entails trade-offs involving capacity, performance, reliability and price. High-end ('mission critical') systems are differentiated from lower end ('business critical') systems by having higher performance and reliability but smaller capacity. Mission critical drives, used for important applications with numerous transactions, are characterized by high speed, a Fibre Channel interface, and relatively low capacity. Business critical drives are generally slower but significantly higher in capacity, and are used for general storage infrastructure.

8.22 For the purposes of the Commission's assessment of the Acquisition it should be noted that Samsung has a minimal enterprise HDD offering.

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<sup>3</sup> *Seagate/ Conner* Case No IV/M.656, at para. 11.

<sup>4</sup> *IBM/ Hitachi Harddisk Business* Case No COMP/M.2821, at para. 13.

<sup>5</sup> *Seagate/ Maxtor* Case No COMP/M.4100, at para. 33.

<sup>6</sup> *Toshiba/ Fujitsu* Case No. COMP/M.5483, at para 11.

*End uses: overlap between HDDs*

- 8.23 There is significant overlap between the characteristics of HDDs used for the different end uses described above. Table 1 illustrates the extent to which these various characteristics are common across HDDs:

**Table 1: Commonality between Characteristics and End Uses of HDDs**

End-use	Mobile	Desktop	Enterprise	Consumer Electronics
Features	Shock Performance Low Noise Low Voltage	High Capacity	High Reliability, High Speed	3.5" : Streaming 2.5" : Low Capacity 1.8" : Low Voltage
Functionality	Note PC, External	DT PC, External	Server	DVR, Game Console, DVC
Density (Max)	2.5" : 500GB/disk 1.8" : 220GB/disk	3.5" : 750GB/disk 2.5" : 500GB/disk	3.5" : 600GB/disk 2.5" : 300GB/disk	Same as Mobile/Desktop
Speed (Krpm)	7.2 / 5.4 / 4.2	7.2 / 5.4	15 / 10 / 7.2	7.2 / 5.4 / 4.2 / 3.6
Interface	PATA/SATA	PATA/SATA	SCSI/FC/SAS	PATA/SATA
Size (Disk)	2.5" / 1.8"	3.5" / 2.5"	3.5" / 2.5"	3.5" / 2.5" / 1.8"

- 8.24 Performance characteristics such as speed and capacity are largely determined by market demand. HDD manufacturers respond to customer needs to produce higher speed or capacity drives, as the market makes clear that optimisation of particular characteristics is required. There are a number of performance characteristics of HDDs that are related to the particular technical parameters of a drive. Some, but not all, characteristics are inter-related. For example, rotational speed and interface are unrelated, but both can impact on seek time (e.g., drives with higher rotational speed also have lower seek times).

#### **The parties' New Zealand activities**

- 8.25 The parties' activities in New Zealand are relatively limited and are described below.

#### **Seagate**

- 8.26 Seagate does not currently have a direct presence in New Zealand (ie no subsidiary, branch or representative office). [

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<sup>7</sup> [

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8.27 [

]<sup>8</sup>

8.28 Internationally, Seagate sells HDDs to OEMs which are incorporated into products such as desktop computers, notebooks and other consumer electronic devices, which are subsequently sold globally, involving into New Zealand.

### **Samsung**

8.29 Samsung does not have a locally incorporated New Zealand subsidiary. However, Samsung Electronics Australia Pty Ltd ("**Samsung Australia**"), a wholly owned subsidiary of Samsung, is registered with the New Zealand Companies Office as an Overseas ASIC company. Its principal place of business in New Zealand listed as Unit A3, 63 Apollo Drive, Mairangi Bay, North Shore City, Auckland 0632, New Zealand.

8.30 [

]

8.31 [

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**9. Describe the industry or industries affected by the proposed acquisition. Where relevant, describe how sales are made, the supply chain(s) of any product(s) or service(s) involved, and the manufacturing process. If relevant, provide a glossary of terms and acronyms.**

### **Manufacture**

9.1 The various components used in the manufacture of HDDs are discussed in section 8, above. While some of these components are produced by the HDD suppliers themselves (principally the read / write heads), most are purchased from large, third party suppliers. Each HDD supplier manufactures HDDs at a small number of large manufacturing facilities, for distribution worldwide. HDD suppliers also contract out some production work to ODMs. An ODM is a company which designs and manufactures a product which is specified and eventually branded by another firm for sale.

### **Distribution**

9.2 There are three distribution channels for HDDs: OEMs, independent distributors and retailers. The largest OEM purchasers of HDDs include PC manufacturers such as

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<sup>8</sup> [

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Hewlett Packard, Dell, Acer, Lenovo, and Asustek as well as enterprise storage suppliers such as EMC and NetApp. More specialized purchasers of HDDs include Sony and Microsoft, which purchase HDDs for their gaming systems; TiVo and DirectTV, which purchase HDDs for their DVRs, and Apple and Motorola that use HDDs in a number of handheld consumer devices such as iPods.

- 9.3 In Seagate's 2010 fiscal year, [ ]. Table 2 below shows Seagate's worldwide revenues across channels for the past three years:

**Table 2: Seagate's Revenues by Channel**

Channel	Fiscal Years Ended		
	2 July 2010	3 July 2009	27 June 2008
<b>OEM</b>	[ ]	[ ]	[ ]
<b>Distributor</b>	[ ]	[ ]	[ ]
<b>Retail</b>	[ ]	[ ]	[ ]

- 9.4 Samsung distributes its HDDs directly to OEMs and through independent distributors, but also consumes approximately [ ] of its HDD production for use in its own downstream products. Attached as **Samsung Confidential Appendix E** is a chart showing Samsung's 2010 sales (revenue and units) by captive, OEM and distribution for each form factor.

*The OEM Channel*

- 9.5 The tables attached at **Seagate Confidential Appendix F** graphically depict the price erosion in desktop and notebook HDD prices, which reflects the substantial purchasing power enjoyed by the OEMs. [ ]

*Independent Distributors*

- 9.6 [ ] These distributors then resell the drives, either to retailers or directly to end-users. Seagate has multiple distributors located in regional locations around the world. [ ]

*Retailers*

9.7

[

]

10. **Describe the current industry trends and developments including the role of imports and exports, emerging technologies, and/or changes in supply and demand dynamics.**

10.1 Emerging technology is the most important development in the digital storage industry. The most relevant examples include:

- (a) **SSDs:** SSDs are data storage devices that use flash-based, solid-state memory to store data. In contrast to HDDs, which contain a number of moving parts, SSDs use microchips to retain data in non-volatile memory chips and contain no moving parts.
- (b) **H-HDD:** H-HDDs work by pairing traditional platter-based storage with non-volatile flash memory. Frequently accessed data are automatically cached in the faster flash memory, decreasing their retrieval time, while other data remain on the traditional disk.
- (c) **Cloud-based data storage** - refers to the storage of data in a virtual, web-based environment. Rather than storing data locally on a HDD, external hard drive, or SSD, cloud-based data is stored on multiple virtual servers, which are hosted by third parties operating large data centres.

10.2 SSD storage applications have been introduced as a potential alternative to redundant system startup or boot disk drives. They have been used in consumer electronics and laptop computer applications, and have already begun to replace certain enterprise HDDs which require high speed input/output. The benefits of SSDs relative to HDDs include increased speed, lower power consumption, increased resistance to shock, and reduced noise and heat generation. SSD drives are also smaller and easier to fit into small devices since they do not require a specific shape determined by the size of the platter.

10.3 While the sale prices of SSDs are generally more expensive than HDDs (see the chart comparing the prices of SSDs and HDDs at **Appendix G**), a simple price comparison is misleading. The benefits of SSDs are already evident for those enterprise servers that require very fast access to data in storage. In these circumstances, the higher speed of SSD over HDD has made SSDs more competitive. By increasing the access speed to stored data, in some cases fewer servers are required. This can represent a substantial saving. The lower power consumption and heat generation of SSD also makes the operating costs of SSD lower than HDD. To date, SSDs have already successfully displaced HDDs in the high-end enterprise space, and the Parties anticipate SSDs moving down to less mission critical applications, as well as proliferating in the mobile and consumer electronics space.

10.4 In 2009 the European Commission concluded in *Toshiba/Fujitsu*<sup>9</sup> that SSDs in general did not belong to the same product market as HDDs, but instead occupied a

<sup>9</sup> Case No COMP/M.5483 *Toshiba/Fujitsu HDD Business*, 11 May 2009.

neighbouring market, given the significant price premium that they command. Currently, the price level differential between SSDs and HDDs varies based on the capacity point: for lower capacity drives, the cost of SSDs is lower or equivalent to HDDs, whereas at higher capacities, HDDs currently maintain a price advantage. As noted above, SSDs have begun to replace certain enterprise HDDs which require high speed input/output (and where 10 HDDs can be replaced by a single SSD). In general, a price premium that is offset by valued technical characteristics can be, on a "quality"-adjusted price basis, no premium at all. [

]

10.5 Further discussion on the constraint provided by SSDs, and other emerging storage devices, is set out in section 21, below.

**11. Please highlight any relevant mergers that have occurred in this industry over the past three years.**

11.1 In 2009 Toshiba acquired the HDD business of Fujitsu (not opposed by the European Commission in *Toshiba / Fujitsu*).

11.2 Western Digital announced on 7 March 2011 that it had entered into a Sale and Purchase Agreement to acquire the HDD business of HDD competitor, Hitachi.<sup>10</sup> This merger has been notified to the European Commission.<sup>11</sup>

11.3 The Applicant is not aware of any other relevant mergers that have occurred in the past three years.

### **PART 3: MARKET DEFINITION**

#### **Horizontal Aggregation**

**12. For each area of aggregation of market shares, please define the relevant market(s).**

12.1 The Acquisition will give rise to aggregation between the parties in respect of the manufacture and wholesale supply of HDDs. The Acquisition will not result in any aggregation in the other areas of Seagate and Samsung's businesses.

12.2 The parties submit that the market for HDDs is worldwide, given the global nature of manufacturing and distribution of HDDs, and is a single product market, given the demand-side and supply-side substitutability of HDDs. Additionally, as described below, other disc storage technology, most notably SSDs, compete against HDD technology today, and in the near future will become even more vigorously competitive and directly substitutable with HDDs.

#### **Previous decisions**

12.3 In *Hewlett-Packard/Compaq*,<sup>12</sup> the Commission considered a market for "enterprise storage systems". Given the evolution of data storage systems since the date of that

<sup>10</sup><http://www.wdc.com/en/company/pressroom/releases.aspx?release=ba433e4b-bff8-4d99-b60f-7f02aa42f444>

<sup>11</sup> Case COMP/M.6203 *Western Digital / Viviti Technologies Limited* (formerly known as Hitachi Global Storage Technologies Holdings Limited).

<sup>12</sup> Decision 455, *Hewlett-Packard Company and Compaq Computer Corporation*, 28 February 2002.

decision (2002) and for the reasons set out below, Seagate does not consider that there remains a separate market for enterprise storage systems.

- 12.4 In *Toshiba/Fujitsu*,<sup>13</sup> the European Commission considered a proposed merger between the HDD businesses of Toshiba and Fujitsu. In that decision, the European Commission did not reach a conclusion on whether the relevant market consisted of all HDDs or should be more narrowly defined by end-user or form factor.

### Product Market

- 12.5 The Parties firmly believe that there exists a single global market for HDDs. While this product market can be differentiated by end use and by form factor, there is a significant degree of demand and supply-side substitutability such that these differentiations should not constitute separate, narrow markets.

#### *Demand-side substitutability*

- 12.6 While HDDs have customarily been categorised by reference to their 'end-use,' such as enterprise, desktop, mobile, and consumer electronics applications, the boundaries between such uses and, accordingly, the categories of the HDDs themselves, have become increasingly blurred. This is particularly true since the same HDDs can be used in a range of applications for different end uses, and a range of HDDs with different features can be used for the same end-use. **Appendix H** illustrates the overlap between end use and the different types of HDDs.
- 12.7 For example, HDDs that are physically and electrically identical can be and are used in desktop computers, digital video recorders and server applications (Seagate's 3.5" Barracuda line of SATA drives are used in all three applications). Similarly, 2.5" HDDs, traditionally built for use in laptop computers, are now utilised in server and enterprise applications (with SATA interfaces or with SAS or FC interfaces) as well as for external portable memory. Only a small amount of firmware modification is required to switch the drives between applications.
- 12.8 Further overlaps between the technological characteristics of HDDs employed for different end-uses include the following:
- (a) Some drives that historically would have been characterised as for desktop use (due to relying on SATA interface, for example) have characteristics akin to enterprise HDDs (such as large capacity and high data access rates). Additional performance extensions are being achieved by incorporating solid state memory into H-HDDs.
  - (b) HDDs using FC, SCSI, SAS, and SATA interfaces (and, occasionally, in low performance, low-use applications, even the PATA interface), are suitable for enterprise-grade storage (and all have been purchased and used in such applications), as are 2.5" and 3.5" drives, rotational speeds between 7,200 rpm and 15,000 rpm, and capacity ranging between 36 GB and 2 TB.
  - (c) Many 3.5" and 2.5" HDDs (particularly for desktop and laptop end-uses, or for consumer electronics products) share common features, specifications and quality levels, with little technical differentiation between the products of competing suppliers. Furthermore, as the relative price difference between 3.5" and 2.5" drives has narrowed, customers have increasingly found ways to use 2.5" drives in areas traditionally filled by 3.5" drives.

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<sup>13</sup> Case No COMP/M.5483 - *Toshiba / Fujitsu HDD Business*, 11 May 2009.

- (d) Laptop drives are typically 2.5" drives, with rotational speeds of 5,400 or 7,200 rpm, SATA or PATA interfaces, and between 80 GB and 500 GB of capacity. The same set of drives are also used for a variety of consumer electronics applications (for example, Xbox and PlayStation 3 gaming systems both use 2.5" SATA drives of various capacities).
- (e) 1.8" HDDs are less commonly used, being incorporated into applications such as GPS systems and MP3 players. Given that this form factor is more expensive per GB than 2.5" HDDs, it is being replaced with flash memory (if the small size, low power consumption and low heat generation is critical) or 2.5" HDDs (if the capacity is critical).

12.9 In addition to the technical overlaps, prices for 2.5" and 3.5" HDDs are converging rapidly. The charts attached at **Seagate Confidential Appendix I** reflect the increasing substitutability of 2.5" and 3.5" HDDs as their prices per unit converge resulting from the decline of the cost of manufacture of 2.5" HDD, holding capacity and rotational speed constant.

*Supply side substitution*

12.10 The same or similar technology is generally used in the production of all types of HDDs. All HDD suppliers can therefore redeploy capacity across products, although the relative ease with which HDD capacity can be redeployed depends on the production model of the particular drive producer. Seagate adopted its platform model, inter alia, to facilitate switching production capacity between HDDs as quickly as possible.

12.11 For products currently in production, the European Commission has previously found that "HDD suppliers are able to shift production between the different types of HDDs and varying technical characteristics within short time frames (immediately or within days) and without significant additional investment".<sup>14</sup> For products that are not currently in production, manufacturers are also able to switch production to new product specifications within relatively short timeframes.

12.12 Seagate has reviewed its own product development costs and histories and has produced estimates of the time and expense required for an existing HDD producer to commence supply of an HDD with different interface, spin speed, form and/or capacity characteristics from HDDs that they currently produce. These estimates reflect the time taken by Seagate to develop such products. Seagate believes that a current producer of enterprise, desktop, mobile or non-small form factor consumer electronics HDDs would be able to switch to produce a particular enterprise or desktop HDD in the following timeframes:

- (a) to change interface (e.g., from SATA to SAS or FC) when the HDD producer already has the relevant controller chip set and code – approximately [ ] from engineering models to commercial shipping and delivery;
- (b) to change interface when the HDD producer uses a third party's controller chip set (and develops the necessary code) – approximately [ ] from engineering models to commercial shipping and delivery (development can be concurrent with form factor and rotational speed development);
- (c) to change interface when the HDD producer must develop the controller chip set and code itself – [ ] from engineering models to commercial shipping and delivery;

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<sup>14</sup> Toshiba/Fujitsu at paragraph 15.

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- (d) to change rotational speed – approximately [ ] from production of the engineering models to commercial shipping and delivery (development can be concurrent with interface and form factor development); and
- (e) to reduce a 3.5" drive to a 2.5" form factor – approximately [ ] from production of the engineering models to commercial shipping and delivery (development can be concurrent with interface and rotational speed development). To increase a 2.5" drive to a 3.5" form factor could be achieved in a much shorter time frame and with lower costs.

12.13 The expansion of an existing product line into a new form factor is also considerably faster and less expensive when a supplier is producing multiple form factors, as some of the expertise required for developing any product in a specific form factor can be generalized to other products having the same form factor. In addition, the incremental costs of such developments are not significant. At the time of its acquisition of Maxtor, Seagate estimated that these costs would be approximately as follows, and believes these estimates are still accurate:

- (a) a new form factor – between [ ] (and lower for expanding an existing product line into a form factor already utilized by the supplier for other products);
- (b) an interface change where the HDD manufacturer already has the chip set (or has commercial access to such chip set) – [ ];
- (c) an interface change where the HDD manufacturer develops the chip set and code – [ ]; and
- (d) an increase in spin speed – between [ ].

12.14 [ ]

12.15 [ ]

]

12.16 Where a HDD producer has previously produced a drive but does not currently do so, it would be in a position to recommence supply even more rapidly than the timeframes suggested above, since it has already developed the necessary technology. For example, Fujitsu ceased production of 3.5" ATA drives in 2002, WD ceased production of 3.5" SCSI drives in 2000 and, more recently, Hitachi developed (but never commercially shipped) 2.5" SAS drives. Each of these entities could recommence commercial production of these drives in little more than the time required to adjust the production lines and acquire the necessary inputs.

*Identity of product market*

12.17 Seagate submits that the rapid changes in HDDs (and the applications in which they are used) in recent years have not only blurred more traditional end-use-based characterisations, but have also created competitive dynamics and conditions that apply and impact across the industry. The current use of drives across multiple applications, the potential for much more use in this manner, and the ease with which existing HDD suppliers can switch production capacity between different drives and can develop new drives combine to reinforce the appropriateness of considering the effects of the Acquisition across the HDD sector as a whole, as well as the impact of SSDs. The expanding scope of such applications is bringing HDDs into competition with an increasing number of alternative types of data storage devices, such as SSD products (including flash memory), hybrid HDDs and cloud-based data storage products. SSDs act as a material competitive constraint on the HDD industry. This constraint is discussed further in section 21 below.

12.18 In summary, the Applicant considers that the product market relevant to this acquisition is the market for HDD products.

**Functional level**

12.19 Seagate is a manufacturer and supplier of HDDs. It also manufactures certain HDD components for use in its own HDDs.

12.20 [

]

12.21 Therefore, the functional level that both the Applicant and Samsung operate in is the manufacture/import and wholesale supply of HDDs.

**Geographic area**

12.22 [

12.23

]

12.24 The following features of the HDD market are relevant to defining the geographic scope of the market:

- (a) the majority of Seagate's HDDs are manufactured in [ ] for supply to countries around the world (including New Zealand);
- (b) HDDs are high value products, particularly proportionate to their weight. This makes it economic to transport HDDs over long distances;
- (c) HDDs are transported worldwide by air; and

(d) price lists do not differ by country.

12.25 Taken together, these factors suggest that the relevant geographic market for the manufacture/import and supply of HDDs is global, and competition will be driven by global trends. However, consistent with the Commission decision in *Hewlett-Packard/Compaq*,<sup>15</sup> section 66 of the Commerce Act requires the Commission to consider the effect, or likely effect, of an acquisition on a *market in New Zealand*. Therefore, the applicant submits that the relevant geographic market for the purposes of the competitive assessment is (at least) national in scope.

#### **Customer dimension and timeframe**

12.26 While the parties and their respective competitors supply HDDs to secondary manufacturers, distributors and direct to customers, the Applicant does not consider that the competitive analysis varies depending on the type of customer. While some elements of the competitive assessment may not apply to direct supply (eg buyer power), direct supply to New Zealand is negligible and has not been considered separately.

12.27 Similarly, the Applicant does not consider there to be a temporal dimension to the market. The market is characterised by frequent, short term transactions. Time considerations may be important in respect of the emergence of new technologies to compete with (or, in some cases, replace) HDDs. These new technologies are discussed separately in section 21 below.

#### **Conclusion in relevant markets**

12.28 On the basis of the above analysis, Seagate proposes a national market for the manufacture/import and wholesale supply of HDDs.

**13. Where relevant, please explain how products or services are differentiated within the market(s).**

13.1 See discussion in section 8 above.

#### **VERTICAL INTEGRATION**

**14. Provide details of any creation or strengthening of vertical integration that would result from the proposed merger. Please use organisational charts or diagrams to illustrate the structure of the ownership and/or control of the participants and the vertical relationships in question.**

14.1 The parties are vertically integrated at different levels of the supply chain. Seagate manufactures inputs to HDD production, whereas Samsung uses some of its HDD production for [ ]. Seagate is only acquiring certain assets of the HDD business of Samsung, therefore the Acquisition will not create further vertical integration of Seagate's business.

14.2 Table 3 below provides a comparison of the vertical integration of the various HDD suppliers. The Parties note that all HDD suppliers that manufacture heads and media also purchase these components from external suppliers.

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<sup>15</sup> Decision 455, *Hewlett-Packard Company and Compaq Computer Corporation*, 28 February 2002.

**Table 3: Vertical integration of HDD manufacturers**

	Upstream Activities					Downstream activities
	Heads	Media	Motors	Parts	Flash memory <sup>16</sup>	
<b>Seagate</b>	✓	✓				
<b>Samsung</b>					[✓]*	[✓]*
<b>WD</b>	✓	✓				
<b>Hitachi</b>	✓	✓			✓**	✓**
<b>Toshiba</b>					✓	✓

\* These are activities of the Seller, and will not be transferred to Seagate in the Acquisition.

\*\* Following the proposed acquisition of Hitachi by WD, the combined entity would not have these activities.

#### **PART 4: COUNTERFACTUAL**

- 15. In the event that the proposed merger does not take place, describe what is likely to happen to the business operations of the merger parties and the market/industry.**
- 15.1 Presently there are five competitors in the market for the manufacture and wholesale supply of HDDs: Seagate, Samsung, WD, Toshiba and Hitachi.
- 15.2 However, there are currently two proposed acquisitions in this market:
- (a) WD is proposing to acquire the HDD business of Hitachi; and
- (b) Seagate is proposing to acquire certain HDD assets of Samsung.
- 15.3 WD announced its proposed acquisition of the HDD business of Hitachi on 7 March 2011. This transaction has not been completed, and is subject to European Commission approval. The Applicant understands that WD has not yet sought clearance in New Zealand for its proposed acquisition.
- 15.4 The Commission has previously given consideration to parallel mergers that occur in the same markets at the same time. In 2009, the Commission cleared parallel acquisitions in the animal and human nutrition markets: *Schering-Plough Merck*<sup>17</sup> and *Pfizer/Wyeth*<sup>18</sup>. In both *Schering-Plough/Merck* and *Pfizer/Wyeth*, the Commission considered there to be multiple factual and counterfactuals, based on whether or not each transaction proceeded, and adopted the factual scenario that would give rise to the greatest competition concerns (ie both transactions proceeding contemporaneously). The Commission then adopted the most competitive counterfactual scenario, in which neither of the proposed acquisitions would go ahead. The Commission stated that if there are no significant competition concerns evident by comparing the most problematic factual with the most competitive counterfactual, it was unlikely that the

<sup>16</sup> For H-HDDs.

<sup>17</sup> Decision 677, *Schering-Plough Corporation and Merck & Co., Inc.*, 20 August 2009.

<sup>18</sup> Decision 667, *Pfizer Inc and Wyeth Corp.*, 20 August 2009.

other likely factual or counterfactual scenario comparisons would give rise to competition concerns.

- 15.5 The Applicant notes that the concept of both transactions proceeding contemporaneously is largely artificial, as the more likely counterfactual is that one transaction will follow the other. In this respect, the Applicant considers that it would be appropriate for the Commission to carry out its assessment on the basis that the Acquisition will occur first. However, for the reasons discussed below, the Applicant considers that there will be no substantial lessening of competition even if the most conservative position is taken on the appropriate counterfactual. Therefore, the Applicant has analysed the competitive effect of the Acquisition on the basis of a factual where the *WD/Hitachi* and *Seagate/Samsung* transactions proceed contemporaneously. This factual scenario is compared with the most competitive counterfactual (the status quo), under which neither transaction will proceed.

## **PART 5: COMPETITION ANALYSIS**

### **EXISTING COMPETITORS**

- 16. Identify all of the relevant competitors in the market(s), including near competitors and importers in the market(s), and describe how they all compete in the market(s).**

#### **Western Digital**

- 16.1 Even absent its proposed acquisition of Hitachi, WD is the number one supplier of HDDs, and is the overall leader in many areas of the HDD industry.
- 16.2 WD's primary business focus is the design, development, manufacture and sale of HDDs to the desktop, mobile, enterprise and consumer electronics markets. WD mainly began producing HDDs in 1988 and has since established itself as the leading HDD supplier. WD's headquarters are in Irvine, California and the company employs approximately 62,000 people at manufacturing facilities in California, Malaysia, Singapore, Thailand and Brazil; design facilities in Southern and Northern California, Colorado and Thailand; and sales offices around the world.
- 16.3 WD offers a large range of products. Its HDDs are used in desktop and notebook computers, corporate networks, home entertainment equipment and stand-alone consumer storage devices. WD's SSDs are used in embedded applications such as network communications, industrial, medical, military and aerospace markets. Its external storage devices provide extra storage and data backup for home users, and the company's home entertainment and networking products are used in relation to digital photos, videos and music. Popular WD products include: the WDC Caviar, a 3.5" drive used in PC and Macintosh desktop and notebook computers; the WDC Scorpio, also used in notebook computers; WD S25, WD RE and WD VelociRaptor, used for enterprise storage; WD AV, used in DVRs and other home entertainment products; and My Passport, used for external storage purposes.
- 16.4 WD recently acquired two companies in order to vertically integrate its operations. In 2010, WD acquired a leading magnetic media operator, Hoya, to ensure that it would have access to key components for its 2.5" drive business. In 2007, WD acquired leading thin-film disk technology manufacturer Komag, allowing it to develop its own disk technologies for the first time.

- 16.5 WD is known for its “manic attention to cost and customer satisfaction,”<sup>19</sup> and its focus on those areas has led it to high profits. Among the company’s strengths are its aforementioned vertical integration, its focus on cost-management in production, and its cash management (the result of controlling its product development expenses).

### **Hitachi Global Storage Technologies**

- 16.6 Since 2003, Hitachi Global Storage Technologies has been a wholly owned subsidiary of Hitachi, Ltd., one of the world’s leading technology companies. Hitachi was formed from a strategic merger in 2003 that brought together Hitachi’s storage technology business and IBM Corporation’s storage technology business, one of the industry’s preeminent businesses.

- 16.7 Hitachi is headquartered in San Jose, California and has regional locations in the United States, United Kingdom, Philippines, Singapore, Thailand, Malaysia, China and Japan. Hitachi currently employs over 35,000 employees worldwide. Its manufacturing facilities, which are known as the industry’s finest, are located in Japan, Mexico, the Philippines, Thailand, Singapore and China. The company developed one of the world’s largest storage technology manufacturing facilities of 3.5” drives in Shenzhen, China in 2006.

- 16.8 There are few, if any, HDD companies that can rival the scope and scale of Hitachi’s HDD operations. It is vertically integrated upstream, and therefore it self-supplies many key components used in HDDs. For instance, in 2009, the company opened a new substrate manufacturing facility in Malaysia. Hitachi’s President, Steve Milligan, noted of the new facility:<sup>20</sup>

[a] primary goal of the Sarawak acquisition was to strengthen vertical integration for purposes of enhancing product time-to-market and customer satisfaction.

- 16.9 Hitachi is a leading innovator in the industry, and enjoys significant technological know-how, experience, and resources. It provides a wide range of products that include advanced HDDs, enterprise-class products, SSDs, and innovative external storage solutions and services. The company notes that it offers:<sup>21</sup>

the broadest range of products that define the standard for hard drive capacity, performance and reliability. The world’s largest storage system and device manufacturers rely on Hitachi hard disk drives for their notebooks and desktop PCs, consumer electronics product and enterprise servers and storage arrays.

- 16.10 Popular Hitachi products include: the Hitachi Deskstar, a 3.5” drive used in PC and Macintosh desktop computers; the Hitachi Travelstar, used in notebook computers; the Hitachi Ultrastar, used for enterprise storage; the Hitachi CinemaStar, 2.5” and 3.5” drives used in digital video recorders and other home entertainment products; and the Hitachi LifeStudio, used for external storage purposes.

### **Toshiba**

- 16.11 Toshiba’s HDD business is headquartered in Irvine, California, and forms part of Toshiba Americas Information Services, which is owned by Toshiba America, Inc., a subsidiary of Toshiba Corporation. Toshiba Corporation is globally recognized as a

<sup>19</sup> Gartner, SWOT: Western Digital, Worldwide, Nov. 25, 2008, at 5-6.

<sup>20</sup> “Hitachi GST Hosts Official Opening of new Substrate Manufacturing Facility in Malaysia,” HGST, October 21, 2009, available at <http://www.hitachigst.com/press-room/2009/hitachi-gst-hosts-official-opening-of-new-substrate-manufacturing-facility-in-malaysia>

<sup>21</sup> <http://www.hitachigst.com/internal-drives/>

world leader and innovator in pioneering high technology, a diversified manufacturer and marketer of advanced electronic and electrical products spanning information and communications systems; digital consumer products; electronic devices and components; power systems, including nuclear energy; industrial and social infrastructure systems; and home appliances.

16.12 Toshiba's Storage Device Division expanded its business in 2009 when it acquired Fujitsu's storage technology business. Prior to the acquisition, Toshiba's Storage Device Division business already produced HDDs and as a result of the acquisition gained Fujitsu's two large manufacturing plants in the Philippines and Thailand. The merger also combined two storage technology businesses with established relationships with two of the largest notebook makers in the world.

16.13 At times in the past, 50% of Toshiba's HDDs were purchased by Toshiba for captive use. Today, the combined Toshiba/Fujitsu entity, Toshiba Storage Device Division, is an industry leader. As the company notes:<sup>22</sup>

[w]e offer the industry's most comprehensive range of storage technologies, from hard disk drives (HDDs) and solid state drives (SSDs) to NAND flash memories and optical disk drives (ODDs).

16.14 Toshiba's Storage Device Division also notes that it is:<sup>23</sup>

the world's only storage supplier that owns design, development, manufacturing, sales, and other infrastructure functions spanning the enterprise, mobile, and retail environments for both HDD and SSD products.

16.15 Toshiba has product development and manufacturing centres located in Japan, China, the United States, Europe, Thailand, and the Philippines. The company has recently expanded its production of HDDs to increase capacity by 62.2 million units a year by expanding its Pathum Thani facility. Popular Toshiba products include: the MKxx61GSYN series, a 2.5" series of hard drives for PC and notebook computers; the MKxx33GSG series, a 1.8" series of hard drives for PC and notebook computers; the MK2001TRKB, used for enterprise storage; and the Canvio, used for external storage. Toshiba is well positioned to take advantage of the current success of Seagate's Momentus XT H-HDD.

16.16 Toshiba has also positioned itself at the forefront of NAND flash memory and recent successes have affirmed it as the dominant leader in the technology. NAND flash memory is the essential piece for viable H-HDDs and with Toshiba's recent revelation of its intention to enter into the H-HDD market, it is clear the company will be utilizing its success in both its HDD manufacturing and its achievements in NAND flash technology to push itself as a leader in H-HDDs.

**17. Outline the estimated market shares in terms of sales, and, where relevant, volume and productive capacity, of the merger parties and competitors identified above. Please include the estimated total value of the domestic market; and the source of the data provided.**

17.1 For the Commission's ease of reference, but without prejudice to the identification of a global HDD market, Seagate provides estimates of market shares in New Zealand. However, Seagate's limited activities in New Zealand means it does not have accurate

<sup>22</sup> <http://www.enterprisestorageforum.com/hardware/news/article.php/3803846/Toshiba-Acquires-Fujitsus-Hard-Drive-Business.htm>

<sup>23</sup> Toshiba, Company, available at <http://sdd.toshiba.com/main.aspx?Path=Company>

market share information. Market shares set out below in Table 4 estimate the origin of HDDs sold in New Zealand (whether directly by the supplier or through distributors).

**Table 4 - Estimated market share for the supply of all HDDs into New Zealand for the year ended 31 December 2010**

Party	Volume share (%)	Revenue share (%)
Seagate	[ ]	[ ]
Samsung	[ ]	[ ]
<b>Merged Entity</b>	<b>[ ]</b>	<b>[ ]</b>
WD	[ ]	[ ]
Hitachi	[ ]	[ ]
<b>WD and Hitachi combined</b>	<b>[ ]</b>	<b>[ ]</b>
Toshiba	[ ]	[ ]
<b>Total</b>	<b>100.00%</b>	<b>100.00%</b>

Source: Samsung estimate

- 17.2 Global market shares (by a variety of form factors and end-uses) are attached as **Appendix J**.
- 17.3 Seagate's total sales by value and volume are set out in Table 5, below. Given the different sources of the market share and the volume/value data, and the fact that some Seagate drives may be imported into New Zealand through third party distributors, we have not estimated value and volume shares for Seagate's competitors. However, the Seagate volumes in the table suggest that the total size of the New Zealand market for the manufacture/importation and supply of all HDDs is around [ ] .

**Table 5 - Seagate's New Zealand volumes**

Year	Total sales value (US\$m)	Total sales volume (000 units)
2010	[ ]	[ ]
2009	[ ]	[ ]

Source: Seagate internal ship-to data

- 17.4 As discussed in paragraph 24.5 - 24.7 below, OEMs can and do switch frequently between HDD suppliers. In addition, as the European Commission observed in *Toshiba/Fujitsu*, "HDD suppliers are able to shift production between the different types of HDDs and varying technical characteristics within short time frames (immediately or within days) and without significant additional investment."<sup>24</sup> This cautions against a snapshot emphasis on share data in any one HDD area as a reliable guide to suppliers' respective positions, or indeed a hypothesis of market power.
- 17.5 For completeness, the position of the various competitors for each end-use is discussed below (all market shares are global).
- (a) **Enterprise Products.** Unlike Seagate, Hitachi, WD and Toshiba, Samsung has only a marginal presence in the total HDD enterprise area. [

] Seagate's market position in the overall

<sup>24</sup> Case No. COMP/M.5483 (11 May 2009) at Paragraph 15

enterprise area is approximately [ ], but this market position would not be materially affected by an acquisition of certain of Samsung's HDD assets. On the other hand, Hitachi's and WD's market shares combine for approximately 26% of the entire enterprise space.

- (b) **Desktop (All 1.8", 2.5" and 3.5" Drives).** Seagate and Samsung have a combined market share of [ ]. Toshiba does not currently have a product marketed for desktop end use. However, because it was once active and it already produces 3.5" enterprise drives, Toshiba could quickly develop a meaningful presence in desktop applications.
- (c) **Notebook (2.5" Drives, few 1.8" Drives).** The notebook area is highly competitive, with all five HDD manufacturers competing heavily to gain share. Like the overall HDD and desktop areas, WD is the largest competitor. Toshiba, Seagate and Hitachi all compete for second place. As noted by IDC in a recent report regarding the worldwide 2.5" mobile market, "Toshiba, Seagate, and Hitachi GST [are all] vying for the #2 market position."<sup>25</sup> Similar to other product areas, Samsung is the smallest competitor. Historically, Hitachi has been either the second or third largest competitor in the notebook space (with WD consistently in the lead). As in the desktops space, WD's and Hitachi's combined share for notebooks would be at or above [ ].
- (d) **Consumer Electronics (2.5" and 3.5" Drives).** There are four strong competitors supplying consumer electronics HDDs: Toshiba, Seagate, WD and Hitachi. Samsung is a marginal competitor in this area, while Toshiba is the largest competitor in this area [ ]. Although WD and Hitachi are the third and fourth largest competitors, they each account for [ ] and of the sales.

17.6 The combined entity will have a post-Acquisition market share of [ ], which exceeds the Commission's safe harbours for a concentrated market. However, the acquisition of Samsung will only result in a small increase in Seagate's existing market share of [ ]. As described earlier in the Application, Samsung's HDD business is relatively [ ], and Samsung cannot be characterised as a dynamic competitor or a maverick in the HDD market. Accordingly, the Acquisition will not result in the loss of dynamic competition. Rather, the Acquisition will remove a weak competitor in the market, and lead to economies of scale and the efficiencies described in section 27 below. Further, the merged entity will continue to face strong competition from WD, particularly if the transaction between WD and Hitachi proceeds, [ ].

**18. To what extent do you consider that the merged entity would be constrained in its actions by the conduct of existing competitors in the markets affected?**

18.1 The market for the supply of HDDs is extremely competitive. As the European Commission recognised in *Toshiba/Fujitsu*, it is characterised by steadily (often steeply) declining prices, a high degree of product innovation, short product life cycles (driven in turn by innovation), volatile market shares and low switching costs.<sup>26</sup> These factors have continued to be features of the market notwithstanding previous consolidation in the industry. The European Commission has also previously noted both the significant fluctuations in market shares (with the degree of unused capacity that this inherently creates) and the ability of existing HDD manufacturers to increase their output, without

<sup>25</sup> "Western Digital Acquires Hitachi GST : WD Gets Bigger, The HDD Industry Gets Better," IDC, March 2011, at 7, at <http://www.idc.com/getdoc.jsp?containerId=227401>

<sup>26</sup> *Toshiba/Fujitsu* at paragraphs 31 - 32.

making major investments. This section considers the constraint provided by existing competitors for HDDs, although given the degree of product innovation in relation to data storage, the emergence of alternative data storage technology will also be a significant constraint, and is discussed in section 21 below.

- 18.2 WD is currently, and will remain, the biggest constraint on the merged entity. This is underlined when it is considered in the context of WD's proposed acquisition of Hitachi, a company that performs a far more significant role in the HDD business than Samsung. WD is the largest HDD competitor by units shipped. Hitachi is currently the third largest HDD competitor. [

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- 18.3 Toshiba will be the smaller competitor following the Acquisition and the merger of WD and Hitachi. However, Toshiba will remain a strong constraint on price and innovation in relation to all product types, and is likely to see the mergers of its rivals as an opportunity to capture market share. It is a leading innovator, illustrated by its leading position in relation to HDDs for consumer electronics. Toshiba does not currently supply a product specifically for desktop HDDs. However, to the extent that any retooling is even necessary for Toshiba to do so, it is likely to be relatively minimal in terms of time and expense, and thus unlikely to serve as a material barrier to supply-side substitution.

- 18.4 There are no capacity constraints in the industry that would prevent an HDD manufacturer from expanding. HDD manufacturers can quickly expand or contract capacity according to their predictions of demand, at relatively low cost. This is evidenced by the reduction in industry capacity during the recessionary period of 2009, and the subsequent increase in response to greater demand in 2011. There are similarly no capacity constraints on inputs to HDDs (for example, TDK has announced that it is planning to increase capacity in 2011).

- 18.5 The HDD market is characterised by a high level of dynamic competition. Continuous innovation is driven by all customers, and the Applicants expects this to continue following the Acquisition. The life cycle of HDDs is two years or less, with suppliers bringing new products to market every 12 to 18 months, whether new versions of HDDs already produced (with better features and functionality), or HDDs comprising new technologies. Innovation is being conducted inter alia to combat the continuing reduction in the increase of areal density of HDDs (against the increasing capacity requirements of end-users), such as the development of heat-assisted magnetic recording (HAMR) and other technologies, as well as focusing on developments aimed at lowering costs / increasing efficiencies to offset the impact of consistently declining ASPs. The significant innovation taking place in each of the SSD, H-HDD and cloud-based data storage areas also has a substantive impact on developments in the overall HDD market. SSD suppliers are no longer just "potential" competitors in the HDD market but now have a successful record of replacing HDDs in certain applications, an occurrence that will only become more frequent.

- 18.6 Finally, the high level of competition between existing participants, notwithstanding previous consolidation in the industry, is illustrated by the consistent decline in average unit price for HDDs. As shown in **Seagate Confidential Appendix F**, [

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## POTENTIAL COMPETITION

### Conditions of Entry

#### 19. Please explain the requirements for new entry and/or importers in the relevant market(s).

- 19.1 It is difficult to identify the likely total costs of entry, given the many alternative ways in which an entrant can choose to enter the HDD sector. There are a number of 'make or buy' choices that a new entrant must make, regarding inputs (such as read/ write heads and media), production facilities, R&D and distribution/ customer service.
- 19.2 As described in paragraphs 8.2-8.10 above, existing HDD providers purchase inputs from third parties and self-supply such inputs. Seagate would expect a new entrant to initially acquire inputs from third parties.
- 19.3 Seagate estimates that a new entrant could construct an entirely new production facility within approximately [ ]. However, a new entrant need not actually build its own facilities. Several contract manufacturers of HDDs have both the production facilities and the know-how to commence production on their own account, including TDK and Foxconn International Holdings Ltd.
- 19.4 Moreover, a production facility would not be necessary if a new entrant contracted with an ODM<sup>27</sup> (or if the new entrant were itself an ODM): a single large OEM can provide sufficient volume to cover the fixed costs associated with the production capital ("sponsoring" entry, in effect) and there are numerous distributors available to provide sales channels to other customers.
- 19.5 Seagate has set out, in paragraph 12.12, estimates for the time and funding required for the R&D necessary to develop particular types of drives and to make additional developments related to interface, rotational speed, form factor and capacity. R&D relating to rotational speed, form factor and capacity can occur concurrently with work on interfaces.
- 19.6 A new entrant need not supply all HDD product lines. In the recent past, other suppliers have operated profitably with more limited product lines at a smaller volume. For example, ExcelStor earned profits for several years producing only 3.5" desktop or consumer electronics drives, eventually exiting when its major customers chose to source their drives from other vendors, supporting Seagate's view that the minimum viable scale is not large. ExcelStor was viable for years while producing approximately 1% of the 3.5" non-Enterprise drives sold in the market.
- 19.7 The discussion above considers entry for the manufacture/import and supply of HDDs on a global basis. However, Seagate understands that there are no significant barriers to entering or expanding in the distribution of HDDs in New Zealand. There is no customs duty for the importation of HDDs into New Zealand, regardless of the country of manufacture, and relative to the high value of the product, the cost of transportation is relatively low. Finally, [

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<sup>27</sup> Original design manufacturers already manufacture HDDs on contract for existing HDD suppliers.

- 20. Include a full discussion on any factors that could impede entry; and what might prompt new entry post-merger.**
- 20.1 Seagate does not consider there to be any factors that would materially impede entry. As discussed further below, purchasers of HDDs are not typically tied to one supplier, so can and do often change supplier or source from multiple suppliers. OEMs have shown a willingness to work with HDD manufacturers to assist entry or expansion. If the merged entity did attempt to exercise market power following the Acquisition, there are a number of channels through which entry could occur.
- 20.2 As discussed further below, purchasers of HDDs are not typically tied to one supplier, so can and do often change supplier or source from multiple suppliers. OEMs have shown a willingness to work with HDD manufacturers to assist entry or expansion. As set out in paragraph 19.6, a new entrant need not supply all product lines.
- 20.3 As well as the exercise of market power by the merged entity (which, for the reasons set out in this application, appears unlikely), factors that might prompt new entry include new developments in HDD technology, or new developments in downstream products which will require innovative data storage solutions.

#### **LIKELIHOOD, EXTENT AND TIMELINESS OF ENTRY (THE LET TEST)**

- 21. Please name any likely businesses (including overseas businesses) you are aware of that do not currently supply the market but which you consider could supply each of the relevant market(s). Discuss the likelihood of such entry.**

##### **Likely entrants**

- 21.1 The Parties believe that there are a number of current suppliers of components for HDDs, contract manufacturers of HDDs and entities that have previously produced, but no longer produce, HDDs that would be able to commence supply in the short term in response to any attempt by existing HDD suppliers to make a small but non-transitory increase in prices.
- 21.2 Several contract manufacturers of HDDs have both the production facilities and the know-how to commence production on their own account. TDK (including SAE Magnetics) is a contract manufacturer of HDDs. Seagate believes that TDK has in the past manufactured HDDs for Toshiba and TDK currently contract manufactures HDDs for Samsung. TDK could viably commence supply in its own name without ending its relationship as a supplier and manufacturer for other producers. TDK is familiar with the HDD manufacturing process, has its own supply of HDD heads, and could easily acquire HDD media from Hoya or Showa Denko.<sup>28</sup> Although TDK supplies HDD heads to HDD manufactures, it faces no capacity constraints.
- 21.3 The parties do not believe TDK faces significant IP or licensing barriers to entry. The industry has a history of cross-licensing under a "Freedom of Action" program. This program is intended, in part, to ensure that industry participants can continue to innovate and compete without fear of IP litigation. The industry also has a history of new entry, rapid innovation, and introductions of new product lines, all of which would not be likely if there were significant IP or licensing barriers. Moreover, TDK is one of the developers of HAMR heads, a next-generation technology that would give it a significant advantage

<sup>28</sup> Both Showa Denko and Hoya have ample capacity to meet an increased demand for their media. See <http://www.cdrinfo.com/sections/news/Details.aspx?Newsid=27459> and <http://www.highbeam.com/doc/1G1-211543588.html>.

over other head manufacturers. TDK or other component suppliers may choose to vertically integrate into HDD production in order to assure a steady channel to market for such a product innovation.

- 21.4 Foxconn International Holdings Ltd, an ODM for HDDs. The Parties believe that Foxconn, as well as a number of other ODMs, could directly provide HDDs to OEMs. Foxconn has the relationships, resources and knowledge to develop HDDs. It is a subsidiary of Hon Hai Precision Industry Co. Ltd, the world's largest maker of electronic components, notably printed circuit boards. Hon Hai's revenue is over US\$60 billion and it employs approximately one million people. Foxconn is a partner for joint-design, joint-development, manufacturing, assembly and after-sales services to the world's largest computer and consumer-electronics manufacturers. It has particularly strong relationship with the largest OEMs.
- 21.5 In addition, OEMs (themselves large users of HDD) have the ability and incentive either to enter the HDD market themselves, or to sponsor entry from a third party. For example, Hewlett-Packard has produced HDDs in the past, and has cross-licence to the necessary intellectual property to do so again in the future. Similarly, since exiting the HDD market, IBM has retained access to the intellectual property necessary to re-enter the market. Either of these parties, or indeed other OEMs, could easily enter into arrangements with contract manufacturers such as ExcelStor and TDK/SAE to enter the HDD market without making plant and capital investments at the outset.
- 21.6 Finally, the HDD market will continue to face pressure from SSD products, H-HDDs and cloud-based data storage. The Parties believe that the barriers to entering the SSD market are low. This is evidenced by the fact that there are approximately 100 SSD providers in the industry right now. Some of the many SSD competitors include Fusion-io, STEC, OCZ, WD, Intel SanDisk, Seagate, Micron, Violin Memory, and RunCore. While Seagate and Samsung are the only HDD manufacturers with H-HDDs on the market, the Parties believe that WD, Toshiba and Hitachi are all working to produce an H-HDD product and will do so by the end of the year.
- 21.7 In many respects, Samsung is a good proxy to TDK, Foxconn's and other ODMs ability to enter the HDD market. In TDK's case, it will be equipped to perform even stronger than Samsung in the HDD market given TDK's ready access to critical HDD components.

#### **Close competitors**

- 21.8 There are a number of technologies that are having an increasing impact on the HDD market, namely SSD, H-HDDs and cloud-based data storage products. Given the power buyer and financial resources of the OEMs, HDD customers have a clear ability and incentive to accelerate their migration from HDD to these alternatives if they experience a perceived unilateral or coordinated HDD price increase. This section therefore discusses recent entrants into each of these technologies, and the impact they are having on the HDD market.

#### *SSD suppliers*

- 21.9 The European Commission noted in *Toshiba/Fujitsu* that "the market investigation showed that the SSD market is currently characterized by dynamic competition with a large number of market players and numerous new entrants".<sup>29</sup> Seagate predicts that [

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<sup>29</sup> Case M.5483 (11 May 2009), para. 47.

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- 21.10 Flash memory is also used in iPods (which previously all incorporated HDDs) and iPads, and is considered to be a better solution for phones, tablets and GPS systems (all of which could have used HDDs instead). SSDs are becoming viable alternatives to HDDs across all product areas (enterprise, personal computing (desktops, notebooks), and consumer electronics). Seagate predicts that [

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- 21.11 There has been significant entry into the production and sale of SSD products that compete with HDD products:

- (a) **STEC** is a leading global provider of enterprise class flash-based SSDs which OEMs integrate into products used by enterprises in a variety of industries. STEC is headquartered in Santa Ana, California, and with locations worldwide states that it "leverages nearly two decades of Solid State knowledge and experience to deliver the industry's most comprehensive line of Solid State Drives".<sup>30</sup> As noted above, STEC markets itself as a competitive alternative to HDDs for high class enterprise storage.

STEC's products are designed specifically for storage systems and enterprise hardware that run applications requiring a high level of input/output operations per second (IOPS) performance, capacity and reliability, as well as low latency.

As discussed in its 2010 Annual Report, STEC primarily competes with the following companies in connection with the sale of its products: Hitachi, Intel, Micron, Samsung, SanDisk, Seagate, SMART Modular, Toshiba, and WD. The company markets itself as a competitive alternative to HDDs in the market for high-performance enterprise-class storage. According to STEC, it has developed SSDs that represent a "new tier of storage that allow[] users to access data faster and on a more efficient basis than HDDs."<sup>31</sup> Indeed, the company describes its SSD products as offering a "combination of faster performance, better reliability and improved energy efficiency when compared to an HDD."<sup>32</sup>

- (b) **Intel** first entered the SSD market in 2007, and a year later introduced its first desktop and laptop SSD products, touting their improved speed and reduced noise and heat compared to traditional hard drives. Intel also announced in 2008 that it had entered into an agreement with Hitachi to develop enterprise SSD solutions. Intel has continued to release new SSD products and was estimated to have 11.7% of the 2009 SSD market by IDC. Intel has created SSD products for a wide variety of market end-uses, including retail.
- (c) **Fusion-io** was founded in 2006 and introduced its first product, the ioDrive, in 2008. Fusion-io is a private company with revenue of approximately US\$100 million a year. It filed for an IPO in March of 2011. Fusion-io offers flash products with much higher IOPS which is important to enterprise markets which require high transaction rates or real-time data access:

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<sup>30</sup> <http://www.stec-inc.com/aboutstec/>

<sup>31</sup> STEC 2010 Annual Report, p3.

<sup>32</sup> Ibid.

- (i) In 2009 Fusion-io entered into an OEM agreement with HP to provide a NAND flash-based storage product for HP's popular BladeSystem.<sup>33</sup> HP's webpage for the product notes the superior speed, performance and lower power requirements of NAND storage compared to HDD solutions.
- (ii) IBM adopted Fusion-io technology for the SSD solution in their system x servers in 2009.
- (iii) In 2010 Dell began to offer Fusion-io technology in several of their PowerEdge server lines.
- (iv) MySpace switched from 15,000 rpm mechanical disk drives in their server farms to a Fusion-io product claiming lower cost than alternative solutions.
- (v) Plixix, the media-sharing website, switched from 15,000 SATA drives to Fusion-io drives and significantly improved performance.
- (vi) Facebook, which uses Fusion-io in their server farms, is Fusion-io's largest customer.

Fusion-io's Chief Marketing Officer has said that it is not uncommon for Fusion-io customers to replace between seven to 10 hard-drive based servers with one server with an io drive, which can result in significant savings.

- (d) **SandForce**, a privately owned company with 100 employees, was founded in 2006 and announced its entry to the SSD market in 2009. SandForce builds SSD controllers, which they provide to over 25 SSD manufacturers. OCZ Technology Group, which entered the SSD market in 2008, is one user of SandForce technology and offers SSD products that fit 1.8", 2.5" and 3.5" form factor sizes. Soliddata uses SandForce technology in their SS series, which they claim are "suitable for server arrays, embedded systems, enterprise machines and high end PCs." Most recently, MX-Technology entered the SSD market after announcing last year its plan to be first to market with the latest standard of Sandforce controller.
- (e) **Pliant Technology**, which completed a US\$15 million financing round in 2009 to support the volume production of its enterprise SSD products, and **Violin Memory**, a privately held company founded in 2005, which offer "value SSDs" (products that don't have the fastest performance or ultimate data integrity, but which nevertheless provide better performance than HDD arrays at a cost well below faster SSDs). In February of 2011, Violin announced a US\$35 million Series B funding round, including investors such as Toshiba.
- (f) **SanDisk**, a historical leader in flash memory cards announced in 2010 that it had built a SSD for the set-top box market. Doron Myersdorf of SanDisk stated: "For the first time, SSDs are now a cost-effective alternative to hard drives in the set-top box market." SanDisk was estimated to have a 5.2% share of SSD market in 2009, according to IDC.

21.12 The competitive effects of the new entrants into the SSD market have been felt by Samsung, which first entered the SSD market in 2005. Despite the recent explosion in the enterprise SSD market, which more than doubled in revenue by the late 2000s, Samsung saw its SSD revenues shrink by almost [ ] in 2010.

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<sup>33</sup> <http://h18004.www1.hp.com/products/blades/info/what-is-a-blade.html>

### ***H-HDD Suppliers***

- 21.13 H-HDDs are forecasted to become an increasingly important option for PC vendors and thus a threat to replace certain types of HDDs, particularly 2.5" drives. H-HDDs run a middle ground between higher price and performance SSDs and traditional HDDs. The goal is to create a hard drive with speeds closer to that of an SSD, but costs close to that of a standard HDD.
- 21.14 H-HDDs work by pairing traditional platter-based storage with non-volatile flash memory. Frequently accessed data are automatically cached in the faster flash memory, decreasing their retrieval time, while other data remain on the traditional disk. H-HDDs are currently only available in the 2.5" form factor, because laptops see the greatest gains from H-HDDs, mainly through the reduced power consumption and faster performance.
- 21.15 In 2007, both Samsung and Seagate introduced their own versions of a 2.5" H-HDD, although these early models failed to see widespread market adoption. Seagate re-entered the H-HDD market through the release of their Momentus XT in 2010. Prior to the XT, H-HDDs relied on the operating system, namely Windows Vista or Windows 7, to perform properly and allocate the appropriate data to the flash memory. The XT eschews reliance on the OS by using a propriety caching algorithm on the disk to identify frequently accessed applications and files and copy them to the flash portion of the drive. This allows the drive to be used on both Windows and Macintosh laptop computers. The success of the XT over its predecessors is in large part due to its performance: it performed much faster than current traditional laptop hard drives but still below SSD levels. The increased performance of the Momentus XT has led Asus to offer it as an upgrade option for its laptop line geared towards the gaming community.
- 21.16 Although Seagate's Momentus XT is currently the only H-HDD available, it will soon see competition from Toshiba in 2011. Although it is uncertain, analysts also speculate that WD will enter the H-HDD market in the near future.
- 21.17 Analysts forecast H-HDDs to become increasingly relevant in the 2.5" HDD market as "additional hybrid HDD solutions will emerge from multiple HDD vendors over the forecast period, and . . . PC vendors over time will realize the advantage and value of an H-HDD storage device as opposed to other options, including SSDs or dual-drive caching solutions that use both an HDD and a low-capacity SSD attached to the PCIe bus."<sup>34</sup>

### ***Cloud-Based Data Storage***

- 21.18 Cloud-based data storage refers to the storage of data in a virtual, web-based environment. Rather than storing data locally on a HDD, external hard drive, or SSD, cloud-based data is stored on multiple virtual servers, which are hosted by third parties operating large data centres. Consumers buy or lease storage capacity from these third party vendors, based on their individualized needs. Thus, in contrast to localized hard drives—where a consumer has access to a limited amount of storage capacity of which they may only use a fraction—cloud-based storage provides consumers with unlimited capacity and enables them to pay only for the space actually used.
- 21.19 In addition to offering consumers the ability to customize their storage capacity needs, cloud-based data storage also offers other distinct advantages. For example, cloud-based data is automatically replicated and backed-up in a secure online environment, preventing the loss of data due to malfunctions in users' hard drives, or hardware generally. Furthermore, cloud-based storage enables users to more easily share

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<sup>34</sup> IDC, Worldwide Hard Disk Drive: 2010-2014 Forecast Update, p 6.

photos, documents, videos, or other files with additional users, as such data is already uploaded to, and accessible in, an online environment. Finally, cloud-based storage allows users to access their data anywhere, anytime—with or without access to their personal computers—as long as the internet is accessible.

- 21.20 The market for cloud-based data storage is expected to expand significantly. A 2010 IDC report predicts that “public cloud services adoption will grow at over five times the rate of the IT industry” in the next year and that “cloud service providers (SPs) and hosters will become more of a must-have segment.”<sup>35</sup> Deloitte’s 2010 Technology Trends report described cloud computing as a “Disruptive Deployment.”<sup>36</sup> Amazon, whose S3/Jungle Disk products were early examples of cloud computing, just released Cloud Drive, which allows consumers to store files (including music and videos) online for access anywhere. Other than Amazon, several other companies already provide cloud-based storage options, including Carbonite, Inc., MozyHome, Symantec’s Norton Online Backup, Windows Live SkyDrive, Pro Softnet’s IDrive Pro, Box.net, Amazon S3/Jungle Disk, and Memeo Backup.
- 21.21 Cloud-based data storage is likely to have a significant impact on competition in the HDD market. As more data is stored in the cloud environment, consumers’ needs for localized data storage will similarly evolve. Indeed, as discussed in a recent IDC report forecasting trends in the worldwide HDD market from 2010-2014:<sup>37</sup>
- [I]everage of the cloud to access data or to stream media content rather than storing user data or multimedia files locally on a PC” is likely to substantially impact “the pace of SSD adoption in PCs, and the product mix and unit volume for HDD demand for portable PC markets. ...
- ..A major change in consumer behavior as it relates to storing or accessing content could lessen the need for high-capacity storage on portable PCs, thus opening the door for acceptance of higher-performance SSDs at capacities lower than equivalent-priced HDDs.
- 21.22 With the proliferation of additional, and in some respects superior, data storage alternatives, consumers will be less inclined to pay for high-capacity (and high cost) HDDs for their personal computers. Instead, they may be more willing to sacrifice localized storage capacity for lower-priced, more efficient external solutions, such as online data storage, external data storage devices including SSDs and external hard drives, or a combination of such technologies.
- 21.23 Moreover, cloud-based data storage is likely to drive demand for smaller, more portable computing devices such as tablets. According to iSuppli, cloud computing is a significant factor that could affect the “tablet-HDD equation, titling the balance in favour of one segment over the other.”<sup>38</sup> The utilization of online storage by tablets owners, “mak[es] tablets less expensive to use and increase[es] their attractiveness, at the expense of traditional devices using hard disk drives.”<sup>39</sup> Again, while it is unlikely that cloud-based storage will replace the HDD market; it is likely to augment consumer demand in this market considerably.
- 21.24 By offering a viable alternative to localized data storage, cloud-based data storage affords consumers a broader pallet of options in selecting both their preferred personal computing device, as well as their desired HDD size in selecting a laptop/PC. As a

<sup>35</sup> IDC Predictions 2011, Welcome to the New Mainstream, December 2, 2010.

<sup>36</sup> Deloitte, Technology Trends 2011, available at <http://www.deloitte.com/us/techtrends2011>.

<sup>37</sup> John Rydning, “Worldwide Hard Disk Drive: 2010-2014 Forecast Update,” IDC, December 2010.

<sup>38</sup> Fang Zhang, “Hard Disk Drive Segment Safe from Tablet Frenzy for Now,” iSuppli, February 14, 2011, available at <http://www.isuppli.com/Memory-and-Storage/MarketWatch/Pages/Hard-Disk-Drive-Segment-Safe-from-Tablet-Frenzy-for-Now.aspx>

<sup>39</sup> Ibid.

result, any analysis of competition in the HDD market must take into account the significant and changing dynamic of data storage alternatives in the personal computing market—including, most significantly, the disruptive competitive influence of cloud-based data storage.

21.25 Cloud-based data storage is currently being offered in New Zealand as a data storage alternative for both individuals and SMEs. Some examples include:

- (a) Orcon, under its iSERVE brand, launched New Zealand's first locally-developed cloud computing service for small to medium-sized enterprises in October 2009. Upon its launch, Orcon marketed the service as a way for customers to increase the capacity of data storage without investing in new infrastructure, and enabling businesses to save on IT costs;<sup>40</sup>
- (b) Gen-i launched its Australasian cloud service in December 2009. Chris Quin, Gen-i Australasia CEO, noted that IDC predicted that cloud computing would become a US\$960 million market across Australia and New Zealand by 2013;<sup>41</sup>
- (c) a number of international companies, such as Amazon, Google and IBM are providing cloud-based services, which are available in New Zealand.<sup>42</sup>

**22. To what extent do you consider that potential entry would be sufficient to constrain the merged entity in the markets affected?**

22.1 The Applicant believes that the continued presence of vigorous competitors such as WD and Toshiba would be sufficient constraint on the merged entity. However, the potential for entry into the HDD market and the development of SSDs will both act to further constrain the merged entry in the affected market. As set out above, those who will be most affected by any potential exercise of market power (OEMs, ODMs and component suppliers) are the most credible potential entrants, and many already have the expertise in the supply and manufacture of HDDs. Similarly, manufacturers of SSDs are continually looking to expand the range of applications for their product, and any price increase in HDDs is likely to encourage this expansion

**23. How long would you expect it to take for entry to occur, and for market supply to increase, in respect of each of the potential entrants named in question 21 above?**

23.1 The likely timeframes for entry and expansion have been described in sections 12 and 18 respectively.

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<sup>40</sup>See [http://www.orcon.net.nz/work/page/cloud\\_computing\\_overview](http://www.orcon.net.nz/work/page/cloud_computing_overview) and [http://www.orcon.net.nz/about/article/orcon\\_launches\\_nzs\\_first\\_locally\\_developed\\_cloud\\_computing\\_service](http://www.orcon.net.nz/about/article/orcon_launches_nzs_first_locally_developed_cloud_computing_service).

<sup>41</sup>See [http://www.gen-i.co.nz/about/newsandevents/Pages/Gen-i\\_launches\\_cloud\\_strategy\\_and\\_services\\_for\\_Australasia.aspx](http://www.gen-i.co.nz/about/newsandevents/Pages/Gen-i_launches_cloud_strategy_and_services_for_Australasia.aspx)

<sup>42</sup>See, for example, <http://www.stuff.co.nz/business/3439923/Can-cloud-computing-put-NZ-on-world-stage>.

## COUNTERVAILING POWER OF BUYERS

### 24. To what extent do you consider that the merged entity would be constrained in its actions by the conduct of buyers in the markets affected?

24.1 Purchasers of HDDs possess very considerable buyer power. As already noted, customers for all types of HDDs are generally large and sophisticated buyers, whether they are OEM's, distributors or large retailers.

24.2 The specific details of price negotiations and design of sales incentives vary considerably across customers. There are certain features, however, that are common among large HDD purchasers.

(a) First, there are no long-term price agreements: large customers negotiate new pricing at least every quarter. Some customers do have long-term contracts (terms of one year or more) in place with some suppliers, but those contracts establish various transaction terms other than price and serve only to focus the range of terms over which short-term negotiations occur. Successful negotiation and supply in one quarter does not guarantee the same level of supply in the next quarter. Some customers may require that a supplier's products be "qualified" (to show that the product meets the technical requirements of the customer), but when there are multiple suppliers qualified then any of the suppliers can win more or less business during a given quarter.

(b) Second, the quarterly purchases by a large customer can constitute a substantial share of a supplier's volume, both for overall volume and for specific products. For example, in Fiscal Year 2010, [

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(c) Third, customers enter into quarterly purchasing agreements involving substantial volumes of their quarterly purchases. It is not uncommon for customers to enter into agreements with multiple suppliers, but those agreements usually involve a large share for the best offer and a much smaller share for secondary suppliers. Once the negotiation for a quarter has been concluded, the customer will often have incentives to maintain during the quarter the volume agreed upon with a winning supplier so as to obtain discounts and rebates that reach the desired discounted price point.

(d) Finally, large purchasers engage in simultaneous bilateral negotiations with each qualified supplier. These negotiations are usually conducted through a combination of meetings, email exchanges and, in some cases, online procurement bidding systems<sup>43</sup>. Typically, negotiations are centred on price and volume of sales. Purchasers use their ability to vary the volumes to be purchased from any one supplier to further increase their bargaining power over price. A purchaser will thus offer suppliers an opportunity to supply a larger proportion of its HDD requirements, in exchange for price concessions. Purchasers consider prices offered by potential suppliers simultaneously, and use competing bids to play suppliers off against each other, thereby driving down price offers. Seagate believes that it is not unusual for all potential

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<sup>43</sup> For example, Google, a large individual HDD purchaser, conducts online auctions for their purchases with 75% of the volume going to the lowest price bidder.

suppliers (including the supplier whose price at that time was the best) to be given the message that some other supplier is offering a better price, in an effort to reduce the offers of all suppliers. Because potential suppliers cannot be sure how their offer relates to those made by their competitors, customers usually drive down prices through a number of different "rounds." It is not unusual for there to be two to four rounds of price offers.

24.3 The bargaining power enjoyed by OEMs has been recognized by the European Commission on a number of occasions in previous investigations into the HDD industry, noting that:

- (a) *IBM/Hitachi*: [c]ustomers for all types of hard disk drives are generally large and sophisticated buyers")<sup>44</sup>;
- (b) *Seagate/Maxtor*: customers, such as HP, IBM and Dell have a large buyer power which mainly results from their multi-sourcing strategy and the possibility to shift volumes on comparably short-term basis. One OEM even indicated that an entry into the enterprise / desktop HDD markets by HDD producers who are so far active only in the mobile or consumer electronics markets could be 'sponsored' by an OEM if an additional supplier was needed<sup>45</sup>; and
- (c) *Toshiba/ Fujitsu*: a group of "concentrated OEMs" had "large countervailing buyer power" after its investigation.<sup>46</sup> The consolidation of OEMs over the last decade has only increased the OEMs ability to discipline HDD manufacturer pricing.

24.4 Moreover, the cost to OEMs of switching capacity between qualified suppliers is extremely low. For each product, different OEMs qualify different HDD suppliers. The qualification process allows OEMs to address a broad range of interoperability, physical and electrical conformity, reliability and performance-related issues that might otherwise be taken into consideration by customers at the purchase ordering stage of acquisition. OEMs source HDDs from multiple suppliers, one reason being to mitigate risk so that, for example, if one HDD manufacturer has a problem with one of its drive lines, the OEM can easily switch to another supplier. [

]

24.5 To optimize pricing, OEMs engage in simultaneous bilateral negotiations with each qualified supplier. Negotiations between OEMs and HDD producers occur in regular short intervals, with cycles that typically are either monthly or quarterly. OEMs consider prices offered by potential suppliers simultaneously, and use the competing bids to play suppliers off against each other, thereby driving down price offers.

24.6 Some customers will effectively renegotiate pricing almost continuously (especially when prices are rapidly and sharply declining), while others will provide feedback regarding the competitiveness of prices (largely with a view to increasing pressure at the next negotiation). Where the customer renegotiates during the quarter, prices might drop two to three times during the quarter. For example, a large OEM might allocate a certain share of its purchases to an HDD manufacturer during initial negotiations at the beginning of the quarter and then request further discounts a month later to match a competing offer. OEMs will tell the HDD manufacturer that they have to provide the

<sup>44</sup> Case No COMP/M.2821, *Hitachi / IBM Harddisk Business*, at para 14.

<sup>45</sup> Case No COMP/M.4100, *Seagate / Maxtor*, at para 28.

<sup>46</sup> Case No COMP/M.5483, *Toshiba / Fujitsu HDD Business*, at para 31.

further discount in order to maintain the share of the OEM's business allocated to the HDD manufacturer at the beginning of the quarter.

24.7 Attached at **Seagate Confidential Appendix K** are some charts illustrating [

]

*Distributors*

24.8 Although HDD suppliers provide list prices for HDDs for distributors, the distributors are nevertheless in a strong position to negotiate volume and other discounts from these price lists. There is no single pattern of negotiation [

]

24.9 As set out in paragraph 9.6, most of Seagate's distributors [

]

**25. If you consider that there is a constraint from buyers, identify the top five buyers by sale and/or volume (including overseas companies/importers) in the relevant market(s). Where there are significant differences in the size of buyers please provide details for five medium and five small buyers.**

25.1 See **Seagate Confidential Appendix L**.

**COORDINATED MARKET POWER**

**26. Identify and discuss the various characteristics of the market that, post-merger, you consider would either facilitate or impede coordination.**

26.1 The risk of coordinated effects post-Acquisition is low. The HDD manufacturing industry is characterised by a number of features which condition against prospects for coordinated effects. Consistent with the approach taken by the High Court in *Brambles New Zealand Ltd v Commerce Commission* (2003) 10 TCLR 868 (HC), the conditions for concluding that there would be effective and sustainable coordinated behaviour as a result of the Acquisition simply do not exist in the HDD industry. The HDD industry, by contrast, is characterised by:

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<sup>47</sup> Case No COMP/M.2821, *Hitachi/ IBM Harddisk Business*.

- (a) Low barriers to expansion (due to excess manufacturing capacity);
- (b) Asymmetry of market shares and of costs;
- (c) A differentiated product offering that is differentiated by product characteristics; and
- (d) Significant countervailing power of purchasers.

26.2 The Commission's Guidelines<sup>48</sup> contain a list of factors relevant to assessing the likelihood of collusive behaviour in a market. An application of these factors indicates the Acquisition is unlikely to give rise to collusive behaviour in the market for the manufacture/import and supply of HDDs:

- (a) *Seller concentration* - three competitors will remain in the market post-Acquisition. While the Acquisition reduces the number of businesses whose actions would need to be co-ordinated, the following characteristics of the industry suggest that collusive behaviour is likely to be unsustainable: supply is awarded in bidding markets, generally for short-term contracts and, due to continually evolving technologies, product innovation occurs at a fast pace. Indeed, in *Toshiba/Fujitsu* the European Commission concluded that these features meant that market co-ordination would be unlikely in the HDD market:<sup>49</sup>

the industry shows patterns of rapid innovation and bidding markets, [such] that HDD suppliers would be unlikely to be able to agree on terms of coordination.

- (b) *Undifferentiated product* - an undifferentiated product market can be conducive to collusion as it makes it easier to reach agreement on price as goods are largely homogenous. However, the product market for HDDs can be differentiated by a number of characteristics including form factor, rotational speed, interface and capacity and by end use: desktop, notebook, consumer electronics and enterprise. The differentiated nature of the product market makes it difficult for HDD suppliers to reach agreement on price.
- (c) *Static production technology* - a lack of changes in technology over time makes collusion easier to maintain. As discussed in this Application, the HDD industry is driven by the evolution of technology, and suppliers are continually repositioning their product offerings on the basis of technology developments and product innovation. This makes it almost impossible to sustain any collusive agreement on price.
- (d) *Slow speed of new entry* - speed of new entry affects the length of time that incumbents can enjoy higher profits from collusive behaviour. The length of time taken for new entry or expansion is discussed in section 23, above.
- (e) *Lack of fringe competitors* - the existence of fringe competitors can disrupt a collusive arrangement. The HDD industry faces significant and growing competition from SSD and other emerging technologies, which constrains its ability price above competitive levels.
- (f) *Acquisition of a maverick business* - the Applicant submits that Samsung is not a maverick or an aggressive competitor in the HDD market (indeed it is a

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<sup>48</sup> Commerce Commission, *Mergers and Acquisitions Guidelines*, 2003, section 9.

<sup>49</sup> Case No COMP/M.5483,

relatively weak competitor, due to its recent failure to turn a profit on its HDD business) (see paragraphs 5.7 - 5.9 above).

- (g) *Price inelastic market demand* - there is relative price inelasticity of demand as HDDs are an essential component for many end uses products. However, this price inelasticity is expected to diminish over time, as the relative price of SSDs decreases, and SSDs become more directly substitutable for HDDs.
- (h) *History of anti-competitive behaviour* - previous occurrences of price-fixing or other forms of collusion may indicate that market conditions are favourable to co-ordination. Neither the Applicant nor Samsung is aware of any past or current co-ordination of activities with any other competitors in supply to the New Zealand market. This could suggest that market conditions in the market for the supply of HDDs are not conducive to collusive behaviour.
- (i) *Characteristics of buyers* - buyers of HDDs have significant countervailing power. There is intense competition between HDD manufacturers to obtain supply contracts from the major OEMs, and accordingly any collusive agreement would be difficult to sustain, due to the incentives to secure greater sales volumes. Major OEMs have multi-sourcing policies for the supply of HDDs and negotiations with OEMs happen bilaterally with all suppliers simultaneously and often in several rounds, rendering the contractual conditions non-transparent. Taken together, the characteristics of buyers, and their significant countervailing power, make it highly unlikely that HDD suppliers would be able to reach or sustain a collusive arrangement.

26.3 In summary, the Applicant currently competes vigorously in the HDD industry. The fast-paced and dynamic nature of this industry, particularly in light of competition from SSDs, will ensure that the proposed Acquisition will not impact on this intense competition.

26.4 For all the reasons set out above, the application of the tests in the Commission's Guidelines reveal that there would not be scope for the Acquisition to give rise to collusive behaviour in this market.

## EFFICIENCIES

27. **If applicable, provide a description of any efficiencies that you believe the acquisition could bring. Would such efficiencies enhance rivalry, or offset the impact of a lessening of competition?**

27.1 Seagate anticipates that the Acquisition will create efficiencies that will enhance rivalry between the remaining competitors. [

]

27.2 While Seagate anticipates that integration and production of Samsung volumes would require some additional expenditure, it believes that the Acquisition would allow the [

].

27.3 [

(a)

(i)

(ii)

(iii)

(b)

(i)

(ii)

(iii)

(c)

(i)

(ii)

(iii)

(d)

(i)

(ii)

27.4

]

27.5 Most or all of the cost reductions are likely to be passed through to customers given their bargaining power and the strength of the competitive constraints post-merger. [

] **Seagate Confidential Appendix F**) indicate that the rents stemming from any reduction in costs have been appropriated by customers (OEMs and distributors). The reduction in the cost of the HDDs for OEMs and distributors has, in turn, resulted in lower prices per unit and lower prices per GB for end consumers.

## OTHER FACTORS

28. Where relevant, provide a description of any other features of the market(s) that should be taken into account in considering the effect of the proposed merger.

**PART 6: FURTHER INFORMATION AND SUPPORTING DOCUMENTATION**

29. Provide the contact details of relevant competitors, buyers and suppliers and any other relevant market participants in the table below.

- 29.1 Set out below are contact details for the parties' competitors and distributors. Where a party's head office is located outside of the Asia Pacific region, we have provided Australian (or Asia Pacific) contact details where possible. Some of this information has been obtained from publicly available sources.

	<b>Name of Company (both legal and trading names)</b>	<b>Contact details (postal and physical address, telephone, fax and website)</b>	<b>Relevant contact person (name, position, and contact details)</b>
<b>COMPETITORS</b>	Western Digital	3355 Michelson Drive, Suite 100, 92612, Irvine, United States of America	Michael Ray +19496725444, <a href="mailto:Michael.Ray@wdc.com">Michael.Ray@wdc.com</a>
	Western Digital (S.E. Asia) Pte. Ltd.	300 Tampines Avenue 5 #05-07, NTUC Income Tampines Junction Singapore 529653	Craig Davis (Director, Sales and Marketing) +6564419909
	Toshiba	1-1, Shibaura 1-chome, Minato-ku, 105-8001, Tokyo, Japan.	Atsutoshi Nishida , +81334574511, <a href="mailto:storage@po.toshiba.co.jp">storage@po.toshiba.co.jp</a>
	Toshiba (Australia) Pty Limited	Building C 12-24 Talavera Road North Ryde NSW 2113	Mark Whittard (Managing Director) +61298876000
	Hitachi	3403 Yerba Buena Road, 95135, San Jose, United States of America.	Chris Dewees, +14087176000, <a href="mailto:Chris.Dewees@hitachigst.com">Chris.Dewees@hitachigst.com</a>
	Hitachi Australia Pty Ltd	Macquarie Park, Lvl 3/82 Waterloo Rd Macquarie Park, NSW, 2113	Steve Milligan, +61298884100
[			

Public version

	Name of Company (both legal and trading names)	Contact details (postal and physical address, telephone, fax and website)	Relevant contact person (name, position, and contact details)
			]

**30. Please provide a copy of the most recent annual report for each of the merger parties. If an annual report is not available, please provide a copy of the audited financial statements of the merger parties (profit and loss account, showing total turnover and profit before tax, and balance sheet). If the merger only relates to a segment of the business of the merger parties, please also provide a copy of any management accounts for the relevant business segment.**

30.1 Seagate's annual report for the period ended 2 July 2010 is at **Appendix M**.

30.2 Samsung does not have management accounts for that part for the HDD business being sold to Seagate. Samsung's accounts for 2010 are contained in **Appendix N**.

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<sup>50</sup> Note - Seagate has terminated this distribution agreement.

**PART 7: CONFIDENTIALITY**

31. **If you wish to request confidentiality for specific information contained in or attached to the notice, please state why you consider the information to be confidential and state the reasons for your request in terms of the criteria set out in the Official Information Act 1982.**
- 31.1 Confidentiality is sought in respect of the information in this application that is contained in square brackets. Confidentiality is sought for the purposes of section 9(2)(b) of the Official Information Act 1982 on the grounds that:
- (a) the information is commercially sensitive and valuable information which is confidential to the participants; and
  - (b) disclosure would be likely unreasonably to prejudice the commercial position of the participants, as the parties providing the information.
- 31.2 The Applicant requests that it be notified of any request made to the Commission under the Official Information Act 1982 for release of the confidential information. The Applicant also requests that the Commission seek and consider The Applicant's views as to whether the information remains confidential and commercially sensitive at the time responses to such requests are being considered.
- 31.3 The foregoing equally applies in respect of any additional information provided to the Commission that is expressed to be confidential.

**Public version**

**THIS NOTICE** is given by Kenneth M. Massaroni of Seagate Technology Public Limited Company

I hereby confirm that:

- all information specified by the Commission has been supplied;
- if information has not been supplied, reasons have been included as to why the information has not been supplied;
- all information known to the applicant which is relevant to the consideration of this application has been supplied; and
- all information supplied is correct as at the date of this application/notice.

I undertake to advise the Commission immediately of any material change in circumstances relating to the application/notice.

Dated this            June 2011

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Kenneth M. Massaroni

I am a director/officer of the company and am duly authorised to make this application/notice.

**SEAGATE CONFIDENTIAL APPENDIX A**

**Seagate's Organisational Chart together with a List of the Entities and their Purpose**

[the contents of this appendix are confidential]

**SAMSUNG CONFIDENTIAL APPENDIX B**

**Samsung's Organisational Chart**

[the contents of this appendix are confidential]

**CONFIDENTIAL APPENDIX C**

**Asset Purchase Agreement**

[the contents of this appendix are confidential]

## APPENDIX D

### Individual Components of an HDD

#### *Hard Drive Read/ Write Heads*

A read/ write head is a small but important part of an HDD. It is an electro-magnet that serves as the immediate interface between the magnetic data recorded on the physical disk and the rest of the computer or other electronic device. Attached to a mechanical arm, it moves over the media substrate as it spins and transposes previously recorded magnetic fields into electrical currents ("reads" the data) or electrical pulses into new magnetic fields to be recorded as bits of data on the platter ("writes" data). The read/ write head executes the encoding technique that translates zeros and ones contained within bits of data into patterns of magnetic fields created by flux reversals (a change in the direction of the electric pulse creates the opposite polarity). Each data bit on the media substrate consists of a pattern of positive-to-negative and negative-to-positive flux reversals, and the read/ write head creates or reads this pattern. New head technology is being developed called heat-assisted magnetic recording ("**HAMR**") in which a laser is mounted on the head and used to heat the platter in order to increase the capacity of the platter.

Most HDD suppliers (with the notable exception of Samsung) self-supply a majority or all of their read/ write head needs, but this production is reserved for internal use. In addition, this captive supply capability is not easily switched to production for the merchant market. In the merchant market for read/ write heads, TDK Corporation ("**TDK**") has been the only provider since its 2007 acquisition of the read/ write heads business of Alps Electric Co. TDK manufactures HDD components on a contract basis for all of the major HDD companies. TDK has no capacity constraints. It operated at less than 90% capacity during 2010, and is planning to boost capacity from 175 million units per year in 2010 to around 190 million in 2011. TDK is also investing heavily in R&D to preserve its place as a market leader in cutting edge technology, including developing HAMR technology.

#### *Hard Drive Media (the Platter)*

A platter consists of a hard substrate that is covered by a thin magnetic coating on which data is recorded. The size of the platter is the primary determinant in the dimensions of a HDD; the HDD form factors (e.g., 2.5" and 3.5") refer to the size of the platter. A HDD consists of one or more platters, and data can be recorded on each side of it. As the platter spins, data is recorded or read by read/ write heads (usually one head per side of a platter) that are moved over the surface of the platter. The substrate material must be rigid, easy to work with, lightweight, stable, magnetically inert, inexpensive and readily available. Historically, aluminium alloy, which has these characteristics, has been the most commonly used substrate.

As technological specifications have increased (e.g., higher spin speeds and decreased distance between the platter and the read/ write head), more demands have been placed upon the quality of platters. Recently, glass has become increasingly more prevalent as the substrate of choice. Glass offers certain advantages, including the ability to create smoother surfaces (increasing reliability and allowing for closer read/ write heads), more rigidity (allowing for thinner and lighter platters and reduced vibration, which decreases the HDD footprint and places less demands on spindle motors), and thermal stability (which causes less expansion and contraction). One disadvantage of glass is its fragility, which is why glass is sometimes combined with ceramic to create more stable composites.

There are three major suppliers of HDD platters in the merchant market: Hoya Corporation, Showa Denko, and Fuji Electric. There are no capacity constraints for these providers; in fact, Hoya and Showa Denko began planning a joint venture in 2009, which was abandoned a few months later due to decreased demand for hard drives. Hoya and Showa Denko each recently

announced expansions in production capacity in anticipation of increased future demand in end markets.

Komag was a major supplier of platters that was recently acquired by WD. In 2008, WD announced that it would no longer supply other HDD manufacturers with platters and, in 2010, WD acquired the magnetic media sputtering assets of Hoya Corporation, which included a multiyear commitment by Hoya to supply glass substrate to WD.

#### *Other Components*

HDDs contain other components such as spindle motors and logic chips. Spindle motors are the mechanisms that spin the platters. While spindle motors are not complicated, they need to provide stable performance at high spin speeds (7,200 and up to 15,000 rpm) over long periods of time, with low vibrations, heat creation, and power usage. Merchant providers of spindle motors include Nidec, Minebea, Japan Industrial Partners, and Panasonic.

Logic chips consist of integrated electronics and controllers that guide the operation of the HDD and provide the interface between the HDD and the computer or electronic device that contains the HDD. These functions include controlling the spindle motor and managing the read/write operations, the location and conversion of data, and caching features. These application-specific integrated circuits, or ASICs, are provided by multiple semiconductor companies, including Agere Systems, Broadcom, IBM, Infineon, LSI Logic Corporation, Marvell, Renesas, QLogic, STMicroelectronics, and Texas Instruments.

**SAMSUNG CONFIDENTIAL APPENDIX E**

**Samsung's 2010 Sales by Channel (By Revenues and Units)**

[the contents of this appendix are confidential]

**SEAGATE CONFIDENTIAL APPENDIX F**

**Charts Showing Declining Prices (All Industry and Seagate and Samsung Only)**

[the contents of this appendix are confidential]

**APPENDIX G**  
**SDD and HDD Average Prices**

## APPENDIX H

### Utilisation of HDDs across End-Users

**SEAGATE CONFIDENTIAL APPENDIX I**

**Charts Showing the Convergence of Price per Unit for 2.5" and 3.5" HDDs**

[the contents of this appendix are confidential]

**CONFIDENTIAL APPENDIX J**

**Share Estimates for 2006 - 2010, Value and Volume, IDC Data**

[the contents of this appendix are confidential]

**SEAGATE CONFIDENTIAL APPENDIX K**

**Charts illustrating revenue received from specific OEMs over a five year period**

[the contents of this appendix are confidential]

**SEAGATE CONFIDENTIAL APPENDIX L**

**Top Five Customers by Product Area and their Share of the Revenue in that Area**

[the contents of this appendix are confidential]

**APPENDIX M**

**Seagate's annual report for the period ended 2 July 2010**

**APPENDIX N**  
**Samsung Annual Report 2010**

