Singapore Journal of Legal Studies
[2017] 1–17

DIGGING DEEP INTO THE OWNERSHIP OF UNDERGROUND SPACE—RECENT CHANGES IN RESPECT OF SUBTERRANEAN LAND USE

ELAINE **CHEW***

Shortly after the government announced its intention to develop a comprehensive underground masterplan, the Singapore Parliament made amendments to the law in the area of the surface landowner's claim to the subsoil underground. This paper outlines and evaluates the changes made and posits that they represent a significant departure from the pre-existing law, particularly in the establishment of a clear cut-off point beneath which the surface landowner may make no ownership claim, and in the creation of a statutory easement in favour of the surface plot over all other land capable of providing subjacent support. These provisions are likely to gain importance as underground development and land use intensifies. However, this paper concludes that the changes bring with them some discomfort as to the content of the rights of real property in Singapore, even as they seek to provide clarity in an area of law where previously a dearth of authority existed, given that critical structural and interpretive gaps in the law remain. There is still some way to go before it can truly be said that a workable legal framework for underground land use has been created.

I. AIRSPACE AND UNDERGROUND

It is no secret that land is often synonymous with wealth. The economic and social status of persons and nations, as well as their physical well-being, are often intimately tied up with ownership of a portion of the earth's surface.[1] As technology and industries develop, and as new economic concepts come into circulation, so too have notions of ownership and the right to exclude the public from access to privately-owned resources shifted at law.

Spatially, the advent of aviation technology in the form of hot-air balloons, and later aeroplanes and helicopters, prompted a rethinking of the meaning of land ownership and access to airspace. In England, the *Civil Aviation Act 1949*[2] was enacted. Reflecting an acknowledgement that the public should have certain rights of access to airspace, the legislation established a statutory defence to trespass claims for authorised air travel, even over privately owned land.[3] At common law, as early as the 1970s, in *Commissioner for Railways v Valuer-General*,[4] Lord Wilberforce had also

* Lecturer, National University of Singapore, Faculty of Law.
1 William A Thomas, "Ownership of Subterranean Space" (1979) 3:4 Underground Space 155 at 155.
2 (UK) 12 & 13 Geo VI, c 64.
3 *Ibid*, s 40.
4 [1974] AC 328 (PC).

cast doubt on the absolutely worded Latin maxim, "*cuius est solum, eius est usque ad caelum et ad infernos*" (for whomsoever owns the soil, it is theirs up to the heavens and down to the centre of the earth) (the "*cuius est solum* maxim"). Prior to that case, the *cuius est solum* maxim had been widely regarded as representing the law on land ownership in England.[5] But by 1974, it was beyond doubt that the absolutely worded *cuius est solum* maxim had been abrogated, at least in respect of airspace. In the landmark case of *Bernstein of Leigh (Baron) v Skyviews & General Ltd*,[6] the more communitarian rule was adopted that as between the rights of an owner to use his land and the rights of the general public to take advantage of all that science now offers in the use of air space, the balance was best struck by "restricting the rights of an owner in the air space over his land to such height as is necessary for the ordinary use and enjoyment of his land and the structures upon it".[7]

Albeit following at a slower pace, there has also been a rethinking of the ownership of underground space. As the human understanding of Earth's core grew, it became apparent that the *cuius est solum* maxim was scientifically untenable.[8] At the same time, in many jurisdictions such as Australia, England and the United States, technological developments, which enabled the increasing exploitation of minerals, gases and other resources found under the surface of the earth, provoked debates about the limits of the surface landowner to rights over the underground. Various statutory regulations on mining and access to underground resources have been enacted, and courts have attempted to grapple with the surface landowner's rights *vis-à-vis* other private claimants, or even the State.[9] In England, for example, an attempt by a neighbour to tunnel under the claimant's land in order to access oil wells between 800 to 2,800 feet underground has resulted in the Supreme Court's decision of *Bocardo*,[10] where there was occasion to consider whether the *Bernstein* rule ought to apply in the context of the extent of a surface landowner's claim to the underground space. Again reflecting a shift away from the absolutist notions propounded by the *cuius est solum* maxim, Lord Hope noted that "[t]here must obviously be some stopping point, as one reaches the point at which physical features such as pressure and temperature render the concept of the strata belonging to anyone so absurd as to be not worth arguing about".[11] However, till today, across jurisdictions, there has yet to be a unitary position taken on how exactly the ownership and use of underground land ought to be regulated.

Should the rules governing a surface landowner's claim to the airspace also apply to the subsoil when there are various spatial features that distinguish the two? There

---

5 Its earliest appearance in a recorded English case was in *Bury v Pope* (1586) I Cro Eliz 118, 78 ER 375. Recently, Lord Hope took the view that it "still has value in English law as encapsulating, in simple language, a proposition of law which has commanded general acceptance" in *Star Energy Weald Basin Limited v Bocardo SA* [2011] AC 380 at para 26 (SC) [*Bocardo*].

6 [1978] 1 QB 479 (HC) [*Bernstein*].

7 *Ibid* at 488.

8 John G Sprankling, "Owning the Center of the Earth" (2007–2008) 55 UCLA L Rev 979 at 992-998.

9 See *eg*, a line of US cases in *Marengo Cave Co v Ross*, 212 Ind 624 (1937); *Edwards v Sims*, 232 Ky 791 (1929); *Coastal Oil & Gas Corp v Garza Energy Trust*, 268 SW 3d 1 (Tex 2008).

10 *Supra* note 5.

11 *Ibid* at para 27.

have been arguments that the analogy between underground space and air is not a fruitful one.[12] For example, while it is possible to fly an aircraft through airspace without having to build attendant structures, roads, tunnels, water channels, or some other equivalent are necessary for underground travel. Further, the construction required to render the underground usable, taking place as it does in the subsoil, has the potential to affect the safety and support of surface structures—this is far less of a concern when it is the use of airspace that is being contemplated.

In Singapore, there has been some consideration of the surface landowner's rights *vis-à-vis* the airspace. Like England, Singapore has enacted an *Air Navigation Act*[13] which exempts authorised aircrafts from trespass liability even when flying over privately owned land.[14] In the case of *Kim Beng Lee v Kosion Enterprise (S) Pte Ltd*,[15] the Singapore High Court has also had occasion to review when a defendant's intrusion into the space over a claimant's land may constitute aerial trespass. By comparison, the development of Singapore law in respect of underground ownership has been far slower and more piecemeal. There are some sparse provisions reserving the right of the State to natural resources found under privately owned land.[16] There are also some statutory provisions allowing the State to install structures such as drains or tunnels under privately owned land.[17] But up until 2015, the law had remained largely silent on the claim of the surface landowner to the underground. This is unsurprising given that Singapore lacks natural resources such as oils and precious metals that are often the stake that triggers debate about the use and ownership of the underground in other jurisdictions. However, as land use becomes intensified, consequent to the pressures imposed by a growing population, and as technology develops enabling the construction of deep underground structures, it has become increasingly important that a position be taken locally with regards to the ownership of the subsoil, a vast spatial resource that the State has repeatedly indicated is intended to be developed in the near future.

Currently, most deep underground installations are in the nature of public works, such as the Deep Tunnel Sewerage System, the Jurong Rock Caverns, and the Downtown Line. There are no private installations at a similar depth to those projects. However, private developers have also begun to dig deeper, creating basements more than 20 metres in depth, such as that found in the ION Orchard or Fusionopolis, for use as retail spaces or car parks. At present, the controlling factor tends to be cost—absent surface space constraints, it remains cheaper for the average developer to build up rather than down.[18] However, that state of affairs may not remain if engineering technologies develop.

---

12 Anthony Dan Tarlock, "Legal Aspects of Use of the Underground" in *Legal, Economic and Energy Considerations in the Use of Underground Space* (Washington DC: National Academy of Sciences, 1974) 41 at 42.

13 Cap 6, 2014 Rev Ed Sing.

14 *Ibid*, s 9.

15 [1993] 3 SLR (R) 909 (HC) [*Kim Beng Lee*].

16 *Eg*, *State Lands Act* (Cap 317, 1996 Rev Ed Sing), ss 4(2), 7(1)(b).

17 *Eg*, *Rapid Transit Systems Act* (Cap 263A, 2004 Rev Ed Sing), ss 5(5), 6.

18 Serene Tng, "Going Underground" *Skyline* (November/December 2012), online: Urban and Redevelopment Authority <https://www.ura.gov.sg/skyline/skyline12/skyline12-06/article-03.html>.

In 2015, a series of amendments were passed, purporting to regulate the ownership of the underground.[19] These amendments are likely to gain in importance, especially when the Urban Redevelopment Authority ("URA") completes its formulation of an underground masterplan, and begins to actively promote the development of that space.[20] The use of legislation to regulate the ownership of the underground is not unprecedented. Across the Straits, Malaysia has had provisions regulating the underground in its *National Land Code*[21] since the 1990s. Further abroad, measures have also been taken in jurisdictions such as Japan, which passed in 2000 the *Special Measures Act for Public Use of Deep Underground Space*.[22]

The sections below outline how, in Singapore, the surface landowner's rights have been modified following recent legislative changes. It is posited that fundamental shifts to land law have occurred following the amendments made to the *State Lands Act*[23] in 2015. The amendments, which clarify the local position on the surface landowner's claim to the underground, are timely in light of the State's plans to intensify the development and use of the underground in the near future.[24] However, gaps in the wording of the new provisions raise legal uncertainty that have to be resolved in order to manage the risk of private landowners seeking to build surface constructions which may affect the underground space. Further, regulations addressing practicalities such as rights to ventilation and access will also be needed to form a comprehensive legal framework for the development and use of the underground.

II. An Overview of the 2015 Amendments

The gist of the 2015 amendments can be found in the new sections 3B and 3C of the *SLA*,[25] which put in place a model with some striking similarities to what Malaysia has done in enacting Part 5(A) of the *NLC*, albeit with certain departures which will be highlighted below. For context, therefore, it is apposite to set out in brief the relevant provisions of the latter legislation. Part 5(A) of the *NLC* contains the bulk of the Malaysian provisions on underground ownership. Under section 92B, when the State alienates land, it is empowered to specify the depth to which the surface landowner may claim the underground. This also applies in the case of the lease of reserved land under section 92E. Pursuant to section 92I(2), the Minister may make regulations specifying the minimum depths which must accompany the alienation

---

19 *State Lands (Amendment) Bill* (No 6 of 2015, Sing), online: Parliament of Singapore <https://www.parliament.gov.sg/sites/default/files/State%20Lands%20(Amendment)%20Bill%206-2015.pdf> [*2015 Bill*].

20 Janice Heng, "Digging Deep in Singapore for Space Solutions" *The Straits Times* (17 June 2015), online: The Straits Times <http://www.straitstimes.com/singapore/digging-deep-in-singapore-for-space-solutions>.

21 Part 5(A) of the *National Land Code*, Act 56 of 1965, Malaysia [*NLC*].

22 Act 87 of 2000, Japan.

23 Cap 317, 1996 Rev Ed Sing [*SLA*].

24 Already, in the recent call for proposals to develop Jurong Lake District, an underground space plan was a specific component of the masterplans that participating teams had to draw up. See "URA puts out call for masterplan proposals to develop Jurong Lake District, billed as Singapore's 2nd CBD" *The Straits Times* (11 July 2016), online: The Straits Times <http://www.straitstimes.com/singapore/ura-puts-out-call-for-master-plan-proposals-to-develop-jurong-lake-district-billed-as>.

25 *2015 Bill*, *supra* note 19, cl 4.

of surface land under sections 92B and 92E. Rules have been laid down specifying that for agricultural, building and industrial land, the minimum depths are 6 metres, 10 metres and 15 metres respectively from the surface:[26]

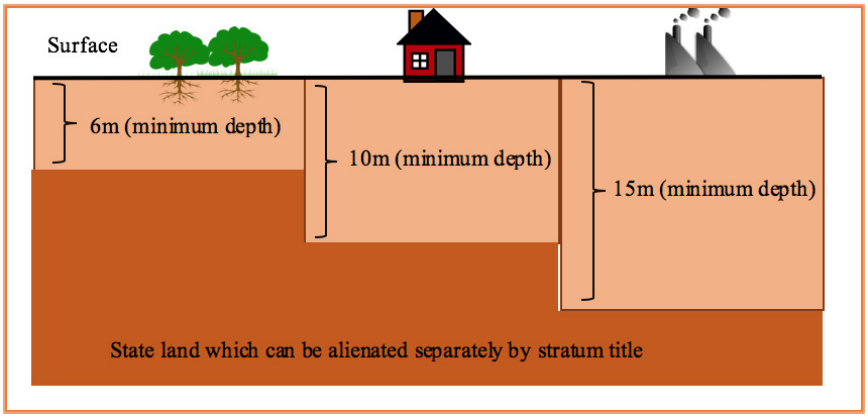

Fig. 1. Minimum Depth Required Under the *NLC*.[27]

These rules do not apply to land alienated prior to 2008 unless a fresh State title is granted after that point. Under section 92B(4), it is also provided that all underground land below that specified by the State Authority to be alienated to the surface landowner remains vested with it as State land. Part 5(A) of the *NLC* also allows the State Authority to alienate or lease underground land separately from the surface land.

By contrast, in Singapore, while the new section 3B also stipulates that the surface landowner can only claim so much underground space as is reasonably necessary for use and enjoyment, a choice has been made not to stipulate different depths for various classifications of land. Instead, under section 3B(1), what is reasonably necessary for use and enjoyment is simply either "such depth of subterranean space as is specified in the State title for that land", or where unspecified, a single cut-off point applies at the subterranean space 30.000 metres below the Singapore Height Datum ("SHD") (the "-30.000 m SHD"). The SHD corresponds to a mean sea level established historically and is also the datum point on which the Reduced Level calculations used by surveyors in Singapore are based.[28] The -30.000 m SHD cut-off point represents a maximum depth claimable by the surface landowner where the State title is silent, rather than a minimum depth that the State has to grant, as is the case in Malaysia.

---

26 *National Land Code (Underground Land) (Minimum Depth) Regulations 2006* (PU(A) 414 of 2016, Malaysia).

27 Farah Zaini *et al*, "Review of the Underground Land Ownership in Malaysia" [2013] 1 Jurnal Pentadbiran Tanah 39.

28 Sections 2 and 8 of the *Boundaries and Survey Maps Act* (Cap 25, 2006 Rev Ed Sing) have been amended to reflect the SHD as the benchmark from which surveying points are measured.

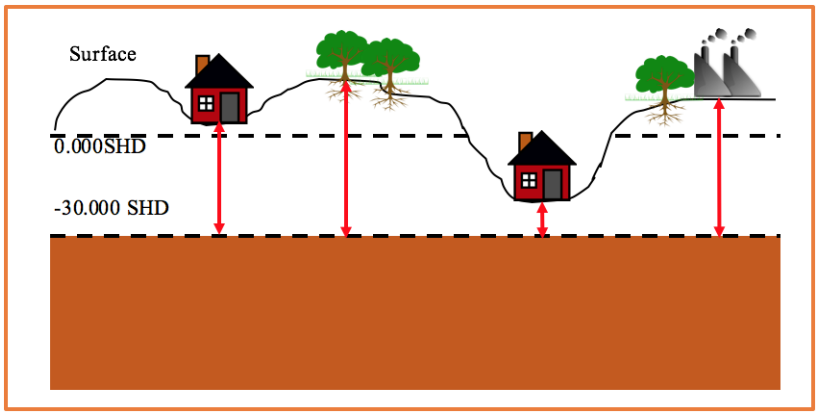

Fig. 2. Maximum Depth Claimable by Surface Landowner Under Section 3B of the *SLA* Absent a Contrary Indication Within State Title.

Turning to the new section 3C, there is no Malaysian equivalent for this provision. Although pursuant to section 3B the surface landowner may not lay claim to underground space beyond what is stipulated in the State title, or where that is silent, -30.000 m SHD, under the new section 3C, the surface landowner may claim a right of easement of support over any parcel of land capable of providing subjacent support. This extends to a right to enter plots subjacent to the surface land, to install or maintain structural supports, although reasonableness in the exercise of the right must be exercised.

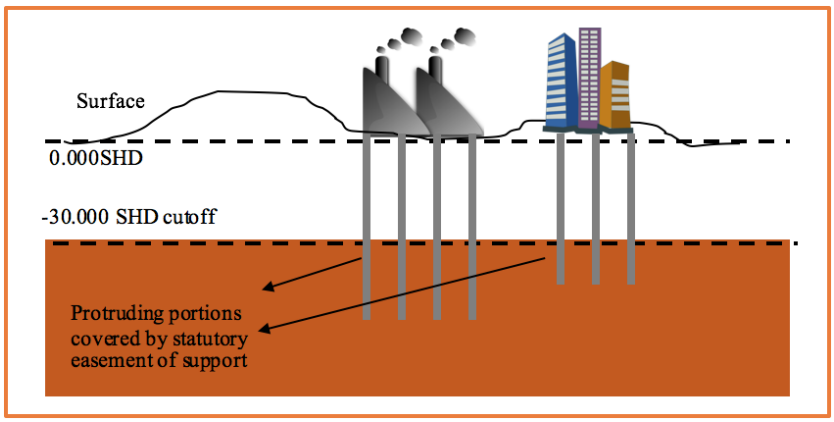

Fig. 3. Easement of Support Conferred by Section 3C of the *SLA*.

Like Malaysia, underground land may be alienated by the State separately from the surface land. Following a separate set of amendments that have been made to Singapore's *Land Acquisition Act*,[29] it is now in essence possible for the State to

[29] Cap 152, 1985 Rev Ed Sing.

create as well as acquire both aerial and underground strata of land separately from the surface.[30]

The Singaporean and Malaysian models are to be contrasted with alternative frameworks adopted by other jurisdictions which have chosen to maintain that the surface landowner can claim all the space underground.[31] In Japan, for example, the landowner may generally lay claim to the underground space below the surface plot.[32] However, the legislative framework put in place by the *Special Measures Act for Public Use of Deep Underground Space*, which applies to specified regions around Tokyo, Nagoya and Osaka[33] where land use is dense, allows other entities license to enter and use the deep underground even without the approval of the surface landowner, provided certain public interest requirements are met.[34] Within the legislative framework, deep underground is defined as the space -40 metres from the ground surface, or -10 metres from the supporting soil (typically, where the foundation piles sit).[35] The distinctive feature of the Singapore and Malaysian models, as compared to the Japanese model, is that the former create a substratum of land beneath the surface plot that is held separately as a separate title, rather than merely carving out rights of access for other non-owner parties as the latter does.[36] The Singapore model goes furthest, in fact, by mandating that even land in which a building's foundation piles sit in might not necessarily belong to the surface owner, but may be the subject, instead, of an easement of support.[37]

III. Changes Consequent to the 2015 Amendments

There are at least three significant shifts in Singapore law on the surface landowner's rights to the underground following the enactment of the 2015 amendments.

A. *Reasonably Necessary for Use and Enjoyment*

The first change of note is that it is now beyond doubt that a surface landowner can only claim so much of the underground as is reasonably necessary for use and enjoyment.

---

30 *Ibid,* s 5(1A) as amended by the *Land Acquisition (Amendment) Act 2015* (No 12 of 2015), s 3.

31 See, for a survey on the different proprietary rights found to exist over the underground, Underground Space Centre, University of Minnesota for the ITA Working Group on Subsurface Planning, "Legal and administrative issues in underground space use: A preliminary survey of ITA member nations" (1991) 6:2 Tunnelling and Underground Space Technology 191 at 195, 196.

32 *Civil Code of Japan* (Act 89 of 1896), art 207.

33 *Supra* note 22, art 3.

34 *Ibid,* art 4.

35 *Ibid*, art 2; *Enforcement Order of the Special Measures Act for Public Use of Deep Underground Space*, Order 500 of 2000, Japan. See also the material published by the Ministry of Land, Infrastructure, Transport and Tourism for a graphic illustration: Ministry of Land, Infrastructure, Transport and Tourism, "大深度地下" at 4, online: Ministry of Land, Infrastructure, Transport and Tourism, Japan <http://www.mlit.go.jp/common/000108804.pdf>.

36 As a conceptual model, such an arrangement had been anticipated as early as 1991 in Kevin Gray, "Property in Thin Air" (1991) 50:2 Cambridge LJ 252 at 258.

37 To borrow the language of Stuart S Ball in "The Vertical Extent of Ownership in Land" (1928) 76:6 U Pa L Rev 631 at 684, it may be apt to say that surface ownership in both Singapore and Malaysia is of the solid matter in a determined cubic space, but in Singapore, there are added certain appurtenant rights respecting the strata beneath that cubic space.

To be sure, in 2013, the Senior Minister of State for Law, who is also incidentally the sponsor of the 2015 amendments, answered an oral question posed by a Member of Parliament, that "our law assumes that the owner of the surface land also owns the underground space, to a depth that is reasonably necessary for the use and enjoyment of the property".[38] The same position was again echoed in the second reading of the *2015 Bill*.[39] The phrasing used by the Senior Minister of State for Law in both instances mirror Griffiths J's holding in *Bernstein* on the ordinary use and enjoyment of land by the surface landowner.[40] However, the assertion that pre-2015 our law assumed that a surface landowner can only claim so much of the underground as is reasonably necessary for use and enjoyment is problematic, and this aspect of the new section 3B should be seen as a change to local law for two reasons.

First, the "reasonably necessary for the use and enjoyment" formulation was by no means consistently adopted across legislation. Pre-2015 amendment, there was no unitary definition of land to be found on the local statute books. Various statutes defined the word "land",[41] but the meanings ascribed varied, and their application extended only so far as the scope of the statute within which each specific definition was found. To be fair, many of these definitions essentially encapsulated the formulation used in Parliament by the Senior Minister of State for Law, but it remains true that there were exceptions. These exceptions necessitated Clauses 8, 9, 10 and 11 of the *2015 Bill*, making amendments to the definition of "land" in the *Land Titles Act*, *Rapid Transit Systems Act*, *Registration of Deeds Act*, and *Sale of Commercial Properties Act* to "bring [them]… in line with the clarifications introduced" by sections 3B and 3C of the *SLA*. For example, the definition of "land" in the *Sale of Commercial Properties Act*, pre-2015 amendment, included "all substances under the surface", directly contradicting the "reasonably necessary for the use and enjoyment" formulation.[42]

Secondly, the "reasonably necessary for the use and enjoyment" formulation could not be said to be the settled position at common law locally, given that the only case which has considered the extent of the surface landowner's ownership appears to be *Kim Beng Lee*.[43] In that case, the plaintiff sued for trespass to land as a ventilation shaft built by the defendant extended into the airspace above the plaintiff's property. In finding for the plaintiff, Selvam JC stated cryptically that the Latin maxim, "*cuius est solum, eius est usque ad caelum et ad infernos*" (for whomsoever owns the soil, it is theirs up to the heavens and down to the centre of the earth) was "part of our law", but the law as laid down in *Bernstein* is the rule that is "[i]n practice".[44] It is unfortunate

---

38 *Parliamentary Debates Singapore: Official Report*, vol 90 (16 September 2013) (Ms Indranee Rajah).

39 *Parliamentary Debates Singapore: Official Report*, vol 93 (13 March 2015) (Ms Indranee Rajah).

40 *Supra* note 6.

41 *Eg*, *Land Titles Act* (Cap 157, 2004 Rev Ed Sing); *Rapid Transit Systems Act* (Cap 263A, 2004 Rev Ed Sing); *Registration of Deeds Act* (Cap 269, 1989 Rev Ed Sing); *Sale of Commercial Properties Act* (Cap 281, 1985 Rev Ed Sing) [*SCPA*].

42 *SCPA*, s 2. See also *Housing Developers Rules* (Cap 130, R 1, 2008 Rev Ed Sing), r 2, which previously defined "land" as including:

> [A]ny tenure, any building or part thereof, so much of the air-space above the surface as may be reasonably used or enjoyed by any proprietor, and all substances under the surface, whether or not held apart from the surface, and any estate or interest therein[.]

43 *Supra* note 15.

44 *Ibid* at para 12.

he did not elucidate further as the maxim and *Bernstein* stand for opposing principles, the former being that land ownership extends above and below ground without limit, and the latter being that there has to be limits to what a surface landowner can lay claim to. Therefore, it cannot be said that the "reasonably necessary for the use and enjoyment" formulation unequivocally represented the state of common law locally prior to the 2015 amendments. Further, both *Kim Beng Lee* and *Bernstein* concern cases of aerial trespass. Strictly speaking, even if their holdings were intended to apply equally to both airspace and the underground, what they have to say about underground ownership is *dicta*.[45] This particularly ought to be so given that there are various factors that distinguish the use of the underground from the use of airspace as already mentioned above.

Taken at its very highest, the best that could be said pre-2015 is that no binding law had been laid down with regards to the surface landowner's claim to the underground, although the case of *Kim Beng Lee* and the definitions of "land" in many pieces of legislation did evince a favourable disposition towards applying the *Bernstein* rule belowground in addition to aboveground should that issue have come up for consideration. Post-2015, the law is beyond clear on the point that a surface landowner can only claim what is "reasonably necessary".

B. *Default Cut-Off of -30.000 m SHD*

The second change of note is the establishment of a default cut-off of -30.000 m SHD as what is reasonably necessary for use and enjoyment where the State title does not specify otherwise. This is a figure that was avowedly "determined after consultation with the industry, lawyers and academics, and an examination of existing known basement depths of Singapore buildings".[46] As was acknowledged by the Senior Minister of State for Law during the second reading of the *2015 Bill*, on the question of what was reasonably necessary for the use and enjoyment of surface land, "there [was] no clarity" as to the depth required.[47] Certainly, the issue had never been considered in any case brought before the courts, or resolved by legislation or ministerial regulation. With the establishment in section 3B of the cut-off point of -30.000 m SHD that applies "for all purposes",[48] further room for debate on how much subsoil the surface landowner can claim has been foreclosed in the absence of a further round of parliamentary amendments. While it remains an open question whether Parliament might revisit the -30.000 m SHD cut-off mark if, over time, developments in technology render it more cost efficient for private developers to go deeper than they currently do on average, it now appears reasonably clear that the issue of how the subsoil ought to be allocated between the surface and underground owner is one within the purview of Parliament rather than the courts.

The -30.000 m SHD cut-off adopted by Parliament further sheds some light on the policy position adopted by the State as to land use and property rights. It has been signalled clearly that recent developments that have occurred abroad, specifically on

---

45 See *eg*, Jill Morgan, "Digging Deep: Property Rights in Subterranean Space and the Challenge of Carbon Capture and Storage" (2013) 62:4 ICLQ 813.

46 *Supra* note 39.

47 *Ibid*.

48 *SLA, supra* note 23, s 3B(1).

the extent of a surface landowner's claim to the underground, are of less persuasion than the unique position of Singapore as a land scarce State. In particular, there has been an implicit rejection of the finding of the UK Supreme Court in *Bocardo* that even subsoil at depths of 2,800 feet—a far greater depth than the cut-off established in Singapore—did not necessarily fall outside of what is reasonable for the surface landowner's use and enjoyment especially if that strata could be worked on.[49] Given current technology, it is already possible to build structures far beyond the depth of -30.000 m SHD. The basements of the Sydney Opera House, which was completed as early as 1973, extends to a depth of 37 metres, the Admiralteyskaya Station in St. Petersburg extends to 84 metres, and in Japan, the Mizunami Research Laboratory is scheduled to reach 1,000 metres underground. Taking this into account, the Singapore position appears to give less weight to what is theoretically possible and more to the reality that for private developers, cost often deters construction underground when aboveground options are available—even the ION Orchard, which has one of the deepest basements in Singapore, stands at a mere 21.5 metres in depth measured from the surface of the land downwards.[50] Regarding the factors governing what is "reasonably necessary" for "use and enjoyment", it also plays down the potential economic value that the surface landowner might realise from a strata of his land even if he has not physically put it to use, provided a willing buyer can be found. Finally, the establishment of the cut-off at -30.000 m SHD when it was foreseen that foundational piles may be installed beyond that point also implies that foundational supports are not a factor in determining what is "reasonably necessary" for the surface landowner's "use and enjoyment". That is a departure from the positions taken in jurisdictions such as Malaysia and England, which laws have been mentioned above.

C. *Easement of Support*

The third change that bears noting is the creation of an easement of subjacent support in favour of the surface parcel of land over any other parcel of land capable of providing subjacent support. The Explanatory Note states that this is "in line"[51] with the Court of Appeal's decision in *Xpress Print v Monocrafts Pte Ltd*.[52] Presumably by this, the drafter intended to indicate that section 3C was an extension or development of the principle in *Xpress Print* rather than a mere restatement or codification, given all that the case decided was that the right of support did not just encapsulate land in its natural state, but extended to structures built on land from the time such structures were erected.

It is significant that the Court of Appeal opined in *Xpress Print* that the right of support for the structures built on the land was founded on the Latin maxim *sic utere*

---

[49] *Supra* note 5. An alternative case that might also have been considered is that of *Boehringer v Montalto*, 254 NYS 276 (Sup Ct 1931), where the decision of the New York State Supreme Court implies that the zone of subsurface ownership should be less than 150 feet deep, at least as applied to residential property.

[50] "What it takes to build an MRT Line" *The Straits Times* (6 May 2013), online: The Straits Times <http://www.straitstimes.com/sites/straitstimes.com/files/ST_20130506_MRT06_3644313.pdf>.

[51] *Supra* note 19 at 9.

[52] [2000] 2 SLR (R) 614 (CA) [*Xpress Print*].

tuo ut alienum non lædas (to use your own property in such a manner as not to injure that of another).[53] Without taking an extremely liberal view of the notions of "use" and "injure", it is somewhat difficult to see how the easement of support created in section 3C of the *SLA* is "in line" with the principle underpinning the holding in *Xpress Print*. The new statutory provision requires not just refraining from injuring the structures built on the surface, but *allowing* permanent installations for the support of the surface structures.[54] Presumably, this would most often mean piles for the support of the multi-storied buildings that are ubiquitous in Singapore as referred to in the parliamentary debates.[55] Necessarily, allowing permanent installations of such a nature would sterilise the ability of the owner of the land providing subjacent support from using parts of his own land. Further, that underground owner is also required to give the surface landowner access to his property for the maintenance of the support structures installed.[56] These are positive duties rather than the negative formulation "not to injure" as encapsulated in the Latin maxim referred to in *Xpress Print*. The Court of Appeal did not seem to have discussed or contemplated such a wide-ranging right as the easement of support in section 3C anywhere in its judgment. It was merely concerned with whether the owner of Plot A could demolish a building on the land, *withdrawing* support to the structures on Plot B, which is an issue far more modest in scope than what section 3C purports to establish.[57] Given these considerations, the easement of support created by section 3C of the *SLA* ought properly to be viewed as a fundamental change to the existing laws on land ownership in Singapore, and what the rights and duties of neighbouring land owners entail.

IV. Implications in the Wake of the Recent Developments on the Subterranean Ownership

Given the dearth of authority on the question of the ownership of the underground pre-existing the 2015 amendments, the new legislation makes large strides in respect of clarifying the local position in that area of law. However, a number of structural and interpretive questions remain in the way of understanding what it is that a surface landowner can or cannot do *vis-à-vis* the underground space. These critical gaps raise conundrums for the surface landowner that will likely come to bear with greater pressure when the scope of underground usage expands, as entities such as the URA envisage that it will.[58] Therefore, even though it has been claimed that the 2015 amendments "will not affect how landowners currently use and develop underground space", and that "landowners will continue to own all the space they need",[59] it is

---

53 *Ibid* at para 48.

54 *SLA, supra* note 23, ss 3C(2)(a), (b).

55 *Supra* note 37.

56 *SLA, supra* note 23, s 3C(2)(c).

57 Even in the English case of *Leakey v National Trust for Places of Historic Interest or Natural Beauty* [1980] QB 485 (CA), where a positive duty was placed on the defendant to vindicate the claimant's right to support, that only extended to having to take steps to remove a known hazard on the defendant's land and not to allowing the claimant access.

58 Royston Sim, "Digging deep for the future" *The Straits Times* (5 February 2015).

59 Ministry of Law, "Legislative changes to facilitate future planning and development of underground space" *Press Releases* (12 February 2015), online: Ministry of Law <https://www.mlaw.gov.sg/content/minlaw/en/news/press-releases/legislative-changes-planning-development-underground-space.html>.

useful to consider what new dimensions the 2015 amendments bring to existing and prospective building projects.

A. *Liability for Underground Space Encroached Upon*

It has already been noted above that deep underground construction at great depths is already technologically possible today. The main limiting factor tends to be the issue of cost efficiency. However, before a surface landowner exercises his entitlement to build all the way up to the edge of the -30.000 m SHD cut-off point, he may need to consider certain facts. First, the -30.000 m SHD cut-off is an abstract point not visible to the naked eye—it likely requires the intervention of surveyors to measure. Secondly, over time, soil shifts and subsidence may cause a structure to sit lower than originally envisaged. In short, if a surface landowner exercises his right to build up to the edge of the -30.000 m SHD cut-off, he needs to make sure that over time, even factoring in soil subsidence, his structure does not end up sitting below that mark, rendering him vulnerable to a suit for trespass or encroachment, or even nuisance, by the owner of the underground plot. The risk is greater for landowners whose parcels sit closer to the 0.000-metre SHD mark than those whose surface land sit at a higher elevation, *eg*, 10.000-metre SHD, and for those whose plots of land sit on softer soil.

There is, however, currently no clear position at law as to what ought to happen in the event that soil subsidence causes the surface structure to inadvertently trespass on the underground plot, and one cannot always assume that the subjacent landowner will be forgiving or willing to settle. Possibly, the surface landowner might attempt to mount a defence, based on section 3C of the *SLA*, that the protruding portion is necessary for the support of the rest of the surface structure, bringing it within the ambit of the easement of subjacent support that each subterranean plot is subject to in respect of the surface land.[60] However, that would require a stretched reading of section 3C, which was clearly not intended to cover such scenarios but to protect foundational supports such as piles.[61] More likely, the court will apply existing principles by extension, and the usual applicable rules will have to be considered. Given the practical difficulties likely to lie in the way of physical removal, it seems probable that the usual remedy for subterranean encroachment, trespass or nuisance will be monetary compensation.[62] The risk of liability to the underground landowner ought to be taken into account by any surface landowner wishing to maximise the use of his entitlement to the subsoil up to -30.000 m SHD beneath his land. The 2015 amendments throw into relief the need for a surface landowner, who also intends to build downwards, to consider the liabilities he may incur not just in respect of horizontally adjacent parcels of land, but also in the subterranean

---

60 *SLA, supra* note 23, s 3C(1).

61 *Supra* note 19.

62 Analogies could be drawn to cases such as *Fima Construction Pte Ltd v Neo & Neo Brothers Pte Ltd* [1991] 1 SLR (R) 156 (HC), particularly where the actual harm caused is *de minimis*, or to *Delaware Mansions Limited v Lord Mayor and Citizens of the City of Westminster* [2002] 1 AC 321 (HL (Eng)), a case involving the intrusion of tree roots below the surface. See also *Amec Developments Limited v Jury's Hotel Management (UK) Limited* [2001] 1 EGLR 81 (HC).

dimension in order to appropriately manage his risk as underground usage becomes more common.

B. *Reasonableness of the Structural Supports Installed*

It has already been mentioned above that the new section 3C(1) of the *SLA* grants the surface parcel of land an easement of support in respect of *any parcel of land* capable of providing it with subjacent (*ie* below) support. Section 3C(2) specifies that the erection or installation of structural support pursuant to this easement of support may only take place in *subterranean space*, which is defined in section 2 of the *SLA* as "the subsoil below the surface of the earth". Section 3C(3) specifies that the person entitled to the benefit of the easement cannot exercise his rights "in a way that unreasonably prevents another person from enjoying the use and occupation of the other person's land", and must "take reasonable steps to minimise damage to land or other property".

The pressing question for the surface landowner, from a risk management angle, is when the installation of structural supports can be said to *unreasonably* prevent the enjoyment of the use and occupation of the subjacent land. The answer cannot possibly be whenever the subjacent owner is prevented from exploiting his land since, necessarily, the installation of piles in the subjacent plot for the support of structures on the surface plot will sterilise whatever portion of the subjacent plot that those structural supports sit in, *ie* the underground owner cannot use or enjoy that portion.

Possibly, the exercise of the right of support could be said to be unreasonable when the structural supports go unnecessarily deep or are unnecessarily intrusive, sterilising a great part of the subjacent plot. However, it is not possible to tell with mathematical precision when that point would be reached, and protracted or litigious disagreements between the surface and subjacent landowner on this issue could very well result in costly delays in time-sensitive construction projects. The situation may also be tricky where, for instance, a surface landowner and a subjacent landowner simultaneously decide to develop their plots of land, such that the surface landowner's installation of foundational piles will negate the ability of the subjacent landowner to build what he wants, and vice versa. Would it be reasonable in the circumstances for the surface landowner to proceed with his construction, and install the foundational piles he needs to support his surface structure? Should such cases be resolved on a first come first served basis?

Ready answers are likely to be thin on the ground given that the easement of support enshrined in section 3C has no precedent in local law, and there is no equivalent that has been adopted by any other jurisdiction, even Malaysia, whose statutory provisions in regard of the ownership of underground land are most like Singapore's. Yet, both as a matter of defining property rights and as a practical matter, parties need to know the extent of any right of support: too much and an underground enterprise may be made unworkable, too little and the surface may be severely damaged.[63]

---

[63] Jean Howell, "Subterranean Land Law: Rights Below the Surface of Land" (2002) N Ir Leg Q 268 at 276.

Given that the intentions behind section 3C is to balance the rights of the surface and subjacent landowner, as alluded to in the Explanatory Note[64] and in Parliament during the second reading,[65] it is likely that the reasonableness of the exercise of one's right of support will have to be subject to a holistic assessment, taking into account factors such as the existence of alternative means of support that are less intrusive, soil and rock conditions, the actual depth of foundations in adjacent plots, the degree to which the subjacent landowner's use of the land has been restricted, and the gross floor area allowance of the respective plots affected. Without clear answers to questions about the content of the obligation of reasonableness, the exercise of the right to support through the installation of structural supports such as piles may well become fraught with potential liability. Until greater clarity is obtained, therefore, the surface landowner might best be served erring on the side of caution and exercising his rights to support under this provision as conservatively as possible, as well as carrying out thorough due diligence to ascertain what developments might be taking place in not just the horizontal but also vertical surroundings of prospective surface projects.

C. *Ownership of the Space Below -30.000 m SHD*

Another area in the law on underground ownership that remains uncertain is who holds title to the space below -30.000 m SHD or whatever cut-off point is stipulated in the State title. In other jurisdictions that have adopted rules similar to the position that a surface landowner may only claim so much of the underground as is reasonably necessary for his use and enjoyment of the surface land, some have argued that the land below the cut-off is *res nullius* and will be subject to the ownership of whosoever reduces it into possession, or alternatively that the person with exclusive control over access to the land is the owner.[66] In Singapore, interestingly, while section 3B(1) of the *SLA* stipulates the cut-off point beyond which the surface landowner may make no claim, and section 3C(6) stipulates that where the land below that cut-off is not the subject of any State title, any reference to a grantee or lessee is a reference to Government. The provision stops just short of clearly stating who owns the land below the cut-off, unlike the Malaysian legislation. However, during the second reading of the *2015 Bill*, the Senior Minister of State for Law made reference to the "State-owned stratum".[67] It appears, therefore, that while not explicitly stated, it was contemplated that the space below what the surface landowner may claim is State land. Given that legislation does not contain a definition of "State land", the best explanation for this conclusion might be the historical fact that title to all land was originally derived from the East India Company, and later by grants made by the British Crown to alienate land.

While it is not an untenable conclusion that the State has the prerogative over unclaimed land which has not been registered as belonging to any private party, some difficulties remain to be resolved. It can be inferred from the parliamentary speeches at the second reading that even pre-2015, there existed developments with

---

64 *Supra* note 19.

65 *Supra* note 39.

66 Adrian J Bradbrook, "The relevance of the Cujus Est Solum Doctrine to the Surface Landowner's Claims to Natural Resources Located Above and Beneath the Land" (1988) 11:4 Adel L Rev 462 at 473.

67 *Supra* note 39.

piling supports that went below the -30.000 m SHD default cut-off; if that were not so, there would be no need to enact the easement of support that is reflected in section 3C of the *SLA* to "ensure that the surface landowner will continue to have a right to sink his piles to the depths necessary to prove support for his surface development".[68] However, what was the basis on which the piles were sunk into that stratum, given that the easement of support only came into being in 2015? It is an inconvenient fact that the folios kept by the Land Titles Registry appear to generally only demarcate plot boundaries in two dimensions, namely length and breadth, omitting any specifications as to depth. Developers also appear to have sunk the necessary piles into the subsoil below the surface plot as a matter of course without seeking permission from the State as the owner of the stratum below -30.000 m SHD.[69] Even accepting, for a moment, that the law in Singapore, following the decision of *Kim Beng Lee*,[70] was that surface landowners could only claim what was reasonably necessary, the assumption on the ground appears to have been that that would also encompass whatever depth of land that is needed for the installation of structural supports.

It is a possible contemplation that the surface landowners and developers were wrong, and that those who had sunk piles at a depth below -30.000 m SHD pre-2015 had encroached on State land. While such persons might have potentially been subject to the penalties for trespassing under the *State Lands Encroachments Act*[71] before 2015, it has been made clear post-amendments that such charges will not be pursued and cannot be sustained.[72] However, although that interpretation is not outside of the realm of logic, it borders on a rhetoric that is entirely dissonant with the reality on the ground that pre-2015, few, if any, appeared to have contemplated that a surface landowner did not also own whatever depths of land that was needed for the installation of structural supports. As mentioned above, the easement of support encapsulated in section 3C of the *SLA* is a new creation, which has no predecessor pre-2015.

The *Land Acquisition Act* sets out the processes by which the State may acquire privately owned land and lays down principles for appropriate compensation. While the *Constitution of the Republic of Singapore*[73] contains no fundamental right to land, it is noteworthy that expropriation other than in accordance with due process of law is prohibited under various bilateral treaties and free trade agreements entered into by Singapore with other states. For example, the *1987 ASEAN Agreement for the Protection and Promotion of Investments* provides that:

> Investments of nationals or companies of any Contracting Party shall not be subject to expropriation nationalisation or any measure equivalent thereto… except for public use, or public purpose, or in the public interest, and-under

---

68 *Ibid*.

69 Such permission is to be contrasted with the usual regulatory approvals that are sought as a matter of course from building authorities such as the URA and the Building and Construction Authority.

70 *Supra* note 15.

71 Cap 315, 1985 Rev Ed Sing, s 7 [*SLEA*].

72 See the new section 7A of the *SLEA*, *ibid*, as amended by the *State Lands (Amendment) Act 2015* (No 11 of 2015, Sing), s 6.

73 1999 Rev Ed Sing.

> due process of law, on a non-discriminatory basis and upon payment of adequate compensation.[74]

Similarly, under the bilateral investment treaty entered into between the UK and Singapore, it is provided that:

> Investments of nationals or companies of either Contracting Party shall not be nationalised, expropriated or subjected to measures having effect equivalent to nationalisation or expropriation in the territory of the other Contracting Party except for a public purpose related to the internal needs of the expropriating Party and against prompt, adequate and effective compensation.[75]

The nuances employed in the various agreements might differ slightly across the board, but the gist of the obligation owed is the same—expropriation is prohibited save in accordance with the law and upon payment of appropriate compensation. A failure to convincingly rationalise the basis on which surface landowners, pre-2015, installed piles into the stratum below -30.000 m SHD could have far-reaching ramifications, as it could expose the State to compensation claims by foreign investors on the basis that the new provisions are tantamount to an indirect expropriation of land previously understood to be owned by the surface landowner.

V. Conclusion

The recent changes to the legislation bring with them some discomfort as to the content of the rights of real property in Singapore even as they seek to provide clarity in an area of law where previously a dearth of authority existed. As discussed above, several structural and interpretive questions remain in the wake of the attempt to resolve the issue of what a surface landowner may claim *vis-à-vis* the underground. The content of the underground landowner's rights and obligations have also been insufficiently fleshed out. For instance, would the underground landowner be obliged to inform the surface landowner if a subterranean construction project was contemplated? Would an environmental impact study be required? Such uncertainties are potential pressure points that will come to be felt more strongly as technology makes increasingly possible what might not be entirely feasible today in respect of underground land use. At some point, the rights of the surface and underground landowner are bound to come into conflict. Even setting aside concerns about legislative interpretation, a number of practical issues that will probably require regulatory intervention also remain unaddressed. A non-exhaustive bucket list of such matters include the right of the underground owner to access ventilation via the surface plots, the creation of a zoning and registration system for underground

---

[74] *Agreement Among The Government of Brunei Darussalam, The Republic of Indonesia, Malaysia, The Republic of The Philippines, The Republic of Singapore, And The Kingdom of Thailand For The Promotion And Protection of Investments*, 15 December 1987 (1988) 27 ILM 612 at art VI (entered into force on 15 December 1987) [*The 1987 ASEAN Agreement for the Protection and Promotion of Investments*].

[75] *Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the Republic of Singapore for the Promotion and Protection of Investments*, 22 July 1975, (1975) UKTS 151, art 5(1) (entered into force on 22 July 1975).

plots of land, the division of gross plot area allowances between surface and underground constructions, safety standards coordinating the needs of both surface and underground structures, and an efficient but fair liability regime for damage caused by underground construction to existing surface structures or vice versa. There remains, therefore, a lot more ground to be covered before it can be properly said that a workable legal framework for the development and use of the underground has been put in place.