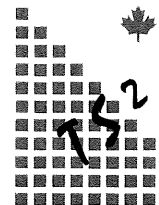


**CROWN CAPITAL ENTERPRISE LIMITED**

**WANCHAI, HONG KONG**

**Demonstration of RJSeal™  
XiShanBei Airport, XishanBei, Hebei,  
Peoples Republic of China**

**August 2003**



**TS² Consulting Inc.  
Lamma, Hong Kong**

# **CROWN CAPITAL ENTERPRISE LIMITED**

## **Demonstration of RJSeal XiShanBei Airport, XishanBei, Hebei, Peoples Republic of China**

**August 2003**

### **TABLE OF CONTENTS**

<b>Section</b>	<b>Description</b>	<b>Page</b>
1.0	Introduction	1
2.0	Co-operative Program	3
3.0	RJSeal™	4
3.1	Prior Experience	4
4.0	Test Program	5
4.1	RJSeal™ Testing	12
4.2	Water Penetration	12
4.3	Fuel Resistance Testing	12
4.4	Elasticity/Ductility Testing	12
5.0	Project Completion Schedule	14

### **FIGURES**

<b>No.</b>	<b>Description</b>	<b>Page</b>
1.0	General Location Map	2
4.0	Specific Location Map	6
4.1	Demonstration Strip	7
4.2	Typical RJSeal™ Application Procedure	9
4.3	Finished Surface	10
4.4	Core Testing	11
4.5	Water Penetration Test	13
5.0	Project Completion Schedule	15

### **TABLES**

<b>No.</b>	<b>Description</b>	<b>Page</b>
4.1	Geographic Location of Test Patch	5
4.2	Geographic Location of Demo Site	8
4.3	Details of RJSeal™ Demonstration Section on XiShanBei Airport, XishanBei, Hebei	8

# **CROWN CAPITAL ENTERPRISE LIMITED**

**Demonstration of RJSeal  
XiShanBei Airport, XishanBei, Hebei,  
Peoples Republic of China**

**August 2003**

## **APPENDICES**

<b><u>No.</u></b>	<b><u>Description</u></b>
A	RJSeal™ – Technical Seminar, Shanghai, China, August 2001
B	RJSeal Descriptive Literature
C	Desco D200 sprayer – Technical Specifications



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Lamma, Hong Kong**

# TS<sup>2</sup> CONSULTING INC. <

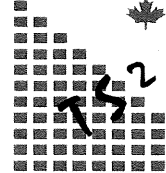
(British Virgin Islands Incorporated) website: <http://ts2.stormloader.com>

## **Hong Kong**

2/F 81 Po Wah Yuen.  
Lamma Island, Hong Kong  
Phone (85-2)-2982-4131  
Fax: (85-2)-2390-5465  
Cellular: (85-2)-9157-6693  
Email: speed\_cny@yahoo.co.uk

## **Canada** (Liaison Office)

1016 Cannock Road S.W.  
Calgary, Alberta  
Canada, T2W IM5  
Phone: (403)-281-3043  
Fax: (403)-281-3043  
Email: speed\_cny@yahoo.co.uk



September 10, 2003

Crown Capital Enterprise Limited  
B5, Centre Point Building  
181 – 185 Gloucester Road,  
Wanchai, Hong Kong.  
Attn: Charence Chiang  
General Manager

Dear Charence

Re: Demonstration of RJSeal™ on the XiShanBei Military Airport, Hebei.

This is the final report on the demonstration of RJSeal™ on the XishanBei Airport located in Hebei Province, some 60 kilometres south-west of Beijing. This demonstration was undertaken on August 6, 7 and 10 and encompassed an initial test patch some 60 metres by 22.5 metres, as well as a 350 metre long section that was 29 metres wide along the centerline of this military airport. The principal interest was restoration of the asphalt pavement's ductility and elasticity as well as improvement of the resistance to water penetration.

Yours Sincerely

---

Anthony G. Speed, P.Eng. (Ontario, Canada)

Crown Capital Enterprise Limited.  
RJS Demo  
XiShanBei Airport, Hebei  
Demo Date Aug 6, 7 & 10/2003  
Prepared by John Qu  
Updated by Heiler Lee  
Revised 7-Sep-03

**Assumptions**

**Conversion Factors**

US Gallon= 3.78 Litres  
Sq Metre= 10.76 Sq Feet  
Sq Metre= 1.20 Sq Yds  
SG 1.04

**Crew**

Desco Op 1  
Desco helper 1  
Truck Driver 1  
Labourers 2  
Supervisor 2  
7

Date	Work Schedule	Work Time (hrs)	Test Length (m)	Test Width (m)	Total Area m <sup>2</sup>	Total Area ft <sup>2</sup> approx	Total Area yd <sup>2</sup> approx	RejuvaSeal Applied			Application Rate						7 Man Crew	
	am/pm							US gals	litres	kgs	USGal /ft <sup>2</sup>	USGal /yd <sup>2</sup>	Litres /m <sup>2</sup>	m <sup>2</sup> /Litre	m <sup>2</sup> /kg	m <sup>2</sup> /man hr	yd <sup>2</sup> /man hr	
6-Aug	8:00–13:00	5.00	60	22.5	1,350	14,524	1,614	423	1,600	1,664	0.006	0.054	0.24	4.13	3.97	188.6	225.4	
			350	15.0	5,250	56,482	6,276											
7-Aug	15:00-17:00	2.00	350	7.1	2,485	26,735	2,971	159	600	624	0.006	0.053	0.24	4.14	3.98	177.5	212.2	
10-Aug	08:30-09:30	1.00	350	7.1	2,485	26,735	2,971	159	600	624	0.006	0.053	0.24	4.14	3.98	355.0	424.4	
	Totals	8.00			11,570	124,475	13,831	741	2,800	2,912	0.006	0.054	0.24	4.13	3.97	206.6	247.0	

# **CROWN CAPITAL ENTERPRISE LIMITED**

## **Demonstration of RJSeal™ XiShanBei Airport, XiShanBei, Hebei Province Peoples Republic of China**

**August 2003**

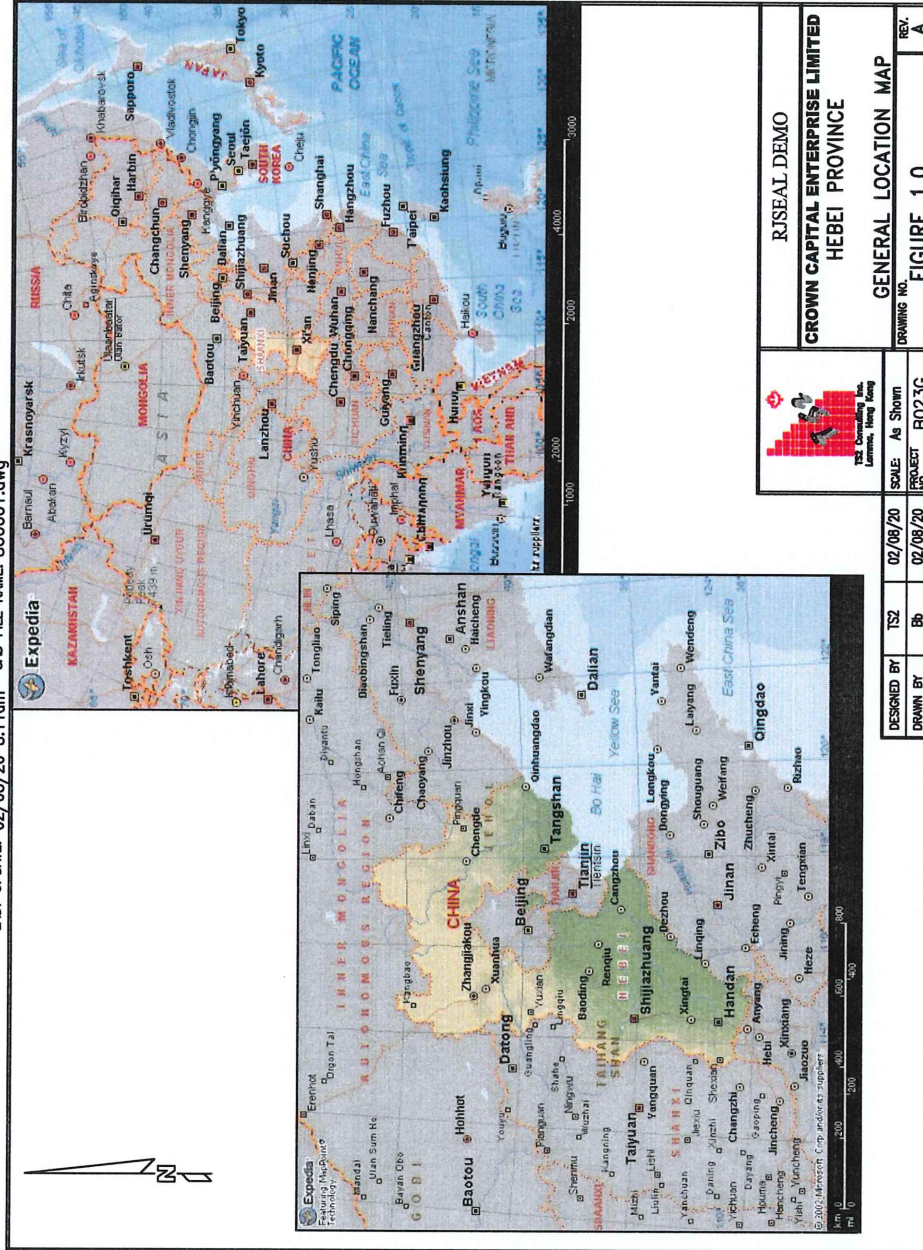
### **1.0 INTRODUCTION**

Crown Capital Enterprise Limited of Hong Kong entered into an arrangement in October 2003, with the Peoples Liberation Army who operate the XiShanBei Airport in XishanBei, Hebei Province, China. This arrangement calls for the analysis of the performance of RJSeal™, a sealer/rejuvenator for asphalt pavement on the sole runway at this military airport.

Hebei Province is situated to the north of the Yellow River (HuangHe) at its confluence with the Bohai Sea. Hebei is bordered by Henan, Shanxi, Shandong and Liaoning Provinces as well as Mongolia. Furthermore, Beijing and TianJin and their independently administered Municipalities are hosted by Hebei Province. Hebei has seen a major growth in the highway system, in recent years, due to a government drive to build national highways linking Beijing and TianJin with major cities in the adjoining provinces and the massive increase in the world export trade. XishanBei, lies some 50 kilometres southwest of Beijing. The capital city of Hebei Province is ShiJiazhuang with a population of approximately 3 million. See figure 1.0 for a map showing the location of XishanBei and Hebei Province. The majority of the area lies at 20 to 40 metres in elevation, on the extensive plain that borders the Sea of Bohai. The regions' latitude (39 degrees north), mean that there are four seasons, with temperatures ranging from 45 Celsius in the long, hot summer to minus 5 Celsius in the short winter. There is no rainy season per-se, just thunderstorms and these occur primarily in June thru August, but can extend into September.

In the immediate XishanBei area, a significant unconsolidated sedimentary sequence predominates and this is due to the site adjoining the delta of the Yellow River. The silt from the flooding that has occurred in the last millennium or two, now obscures all outcrops. Drainage channels feeding into the Yellow River also afford no opportunities to see the bedrock. The asphalt in the area is manufactured from imported materials, which is comprised of crushed and screened sandstone and diorites hauled in from quarries elsewhere in Hebei Province, as well as washed gravels from the various rivers. The bitumen binder for the asphalt is sourced from various locations. Since Hebei Province borders the Sea of Bohai, the possibility of bitumen being sourced from offshore is a distinct possibility so refineries in Singapore and the like should not be forgotten.

LAST UPDATE: 02/08/20 8:11am CAD FILE NAME: 800001.dwg



## **2.0 CO-OPERATIVE PROGRAM**

The intent of the arrangement with XiShanBei Airport is to demonstrate RJSeal™ to show its effectiveness in preventing water infiltration and extending the life of the Asphalt Pavement overlay, which sits atop a concrete base. A demonstration was undertaken on XiShanBei Airport on August 6, 7 and 10, 2003. The north-south runway is 56 metres wide and 3500 metres long. No details are known about the subgrade, but inspection of the shoulders show a sandy-silty material. Furthermore, the 1992 asphalt pavement is approaching the end of its useful life and keen interest was expressed in having the life extended. The airport authority is concerned about water percolating through the asphalt and softening the sub-grade.



### **3.0 RJSEAL™**

RJSeal™ is a proprietary product that is supplied by Crown Capital Enterprise Limited of Wanchai, Hong Kong. RJSeal™ has been proven in numerous applications in North and South America to rejuvenate asphalt pavement at various stages of its life and economically extend the life of the pavement. RJSeal™ is a three component, asphalt sealer rejuvenator that is comprised of Coal Tar, Coal Tar Oils and Petroleum Solvents.

### **3.1 PRIOR EXPERIENCE**

Refer to Appendix A for a copy of the brochure provided to participants at a seminar held in Shanghai in August 2001. This outlines the experience with RJSeal™ at various locations in North America and South America. Further information is available from Crown Capital Enterprise Limited. RJSeal™ has been used at numerous airports in North and South America, as well as highways in Alberta, Canada; Cearo State, Brazil and North Dakota and Texas, as well as other locations in the U.S.A. Since 2000, RJSeal™ has been demonstrated successfully at over twenty six (26) locations in China and five (5) commercial-scale applications have taken place at various locations, including Shanghai and Kunming.

#### **4.0 TEST PROGRAM**

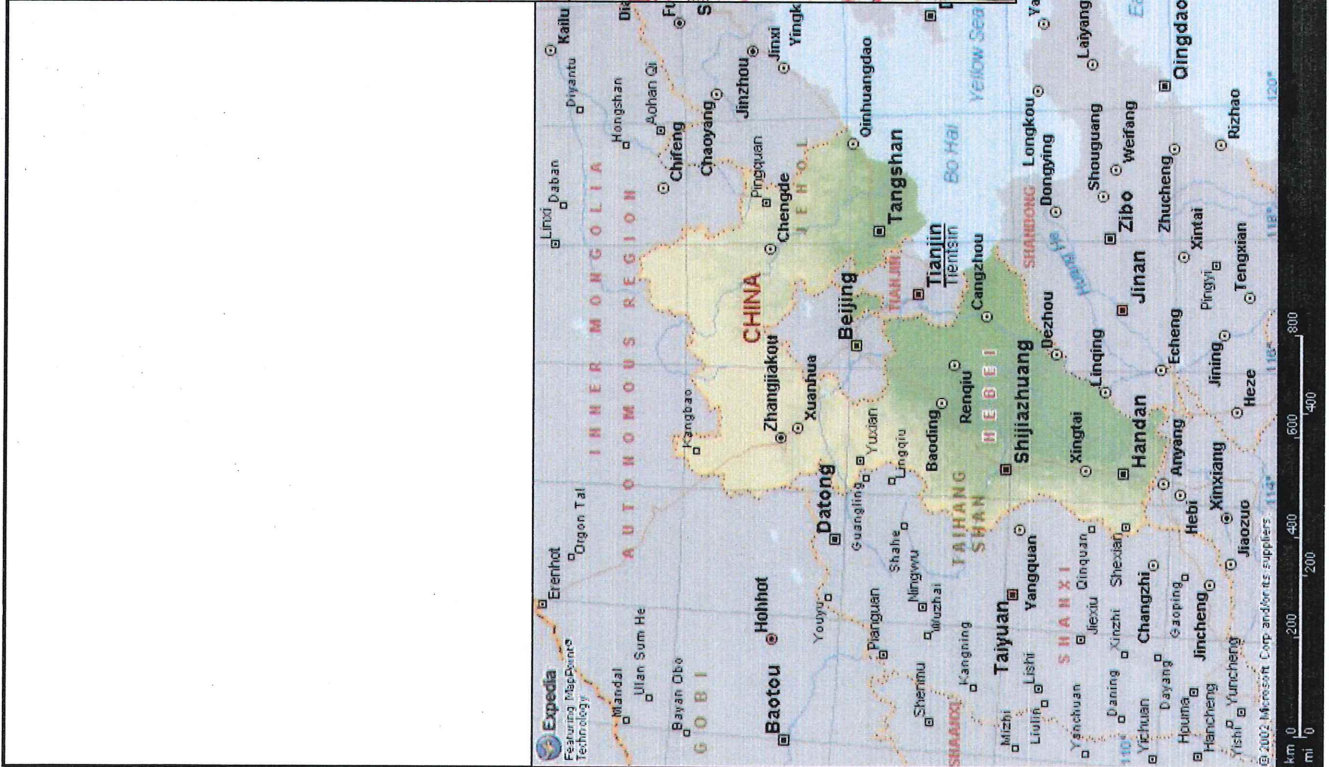
Since XishanBei, Hebei is located in a semi-tropical climate (Latitude: 38 North) at a low altitude (10 to 20 metres), it's a demanding setting for asphalt, given the year round warm climate (extremes of 45 Celsius in summer and minus 5 Celsius in the winter) and intense exposure to ultraviolet radiation, all which contribute to the oxidation and breakdown of the asphalt binder.

The Peoples Liberation Army is responsible for the maintenance and operation of the Airport in XishanBei, They are definitely interested in economically extending the life of the asphalt runway and to this end, has agreed to try RJSeal™ on the sole runway at XiShanBei Airport, which is located near XishanBei, Hebei The arrangement with Crown Capital led to the airport authority selecting an appropriate location for the testing of RJSeal™. See Figure 4.0, showing the location of this airport with respect to XishanBei, Hebei.

Inspection of the runway earlier in July by personnel from Crown Capital, led to the assumption that an application rate of 4.0 m<sup>2</sup>/litre would be appropriate for the asphalt pavement on the runway. A trial patch some 60 metres long and 22.5 metres wide was undertaken on August 6 to confirm that this application rate was adequate. This test patch was nominally at the following geographic location:

<b>Table 4.1</b>	<b>Geographic Location of Test Patch Site</b>	
<b>System</b>	<b>Northing</b>	<b>Easting</b>
Geographic (deg, min)	39 <sup>0</sup> 8.0'	115 <sup>0</sup> 18.0'

The location of the demonstration patch is graphically shown in figure 4.1, which follows.




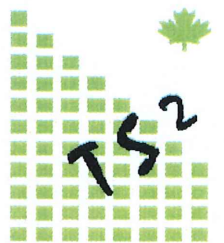
 TSZ Consulting Inc. Lamma, Hong Kong		SCALE: NTS	PROJECT NO. B023E	DRAWING NO. FIGURE 4.0	REV. A
<b>RJSEAL DEMO</b>					
<b>CROWN CAPITAL ENTERPRISE LIMITED</b>					
<b>DETAILED LOCATION MAP</b>					





Figure 4.1 Test Patch, XiShanBei Airport.



A 350 metre long demonstration strip on the centreline of the runway was undertaken, on August 7, 8 and 10. The demonstration strip was 29 metres wide. the location of the demonstration strip at XiShanBei Airport was selected by the Peoples Liberation Army who are responsible for the airport and is geographically located as follows:

<b>Table 4.2</b>	<b>Location of Demo Site</b>	
<b>System</b>	<b>Northing</b>	<b>Easting</b>
Geographic (deg, min)	39 <sup>0</sup> 8.0'	115 <sup>0</sup> 18.0'

Work commenced on the demonstration section on August 6 where the air temperature was around 28 Celsius. The test section had no significant oil spills or fuel spills. There were cracks which match the joints in the underlying, hexagonal shaped, cast-in-place concrete slabs. The aging and oxidation of the bitumen extends to a depth of several millimetres. The entire portion of the runway was on a compacted silty-clay, sub-grade. See figure 4.2 and figure 4.4 for a graphic portrayal of these cracks. These were in the range of 4 millimetre to 8 millimetre width.

Details of the RJSeal™ application are summarized in the table that follows:

<b>Table 4.3</b>				<b>Details on RJSeal™ Demonstration Section on XiShanBei Airport</b>							
Work Schedule	Work Time (hrs)	Test Length (m)	Test Width (m)	Total Area m <sup>2</sup>	Total Area yd <sup>2</sup>	RJSeal™ Applied			Application Rate		
						US gals	litres	kgs	US Gal /yd2	m <sup>2</sup> /Litre	m <sup>2</sup> /kg
Aug 6 8:00-13:00	5	60	22.5	1350	1614	423	1600	1664	0.054	4.13	3.97
		350	15	5250	6276						
Aug 7 15:00-17:00	2	350	7.1	2485	2971	159	600	624	0.053	4.14	3.98
Aug 10 08:30-09:30	1	350	7.1	2485	2971	159	600	624	0.053	4.14	3.98
Totals	8			11,570	13,831	741	2800	2912	0.054	4.13	3.97

Photos showing the test application of RJSeal™ follow in figures 4.2, 4.3 and 4.4. on the following pages. The site was visited on August 10 around 3:00 pm and a difference was readily perceived between the RJSeal™ treated section and the adjoining untreated asphalt.





Figure 4.2 Typical Application Procedure.





Figure 4.3 Finished Surface.

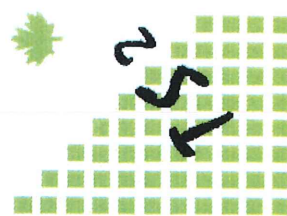
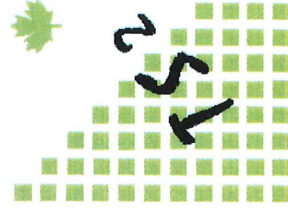






Figure 4.4 Core Sample - Prior to Application





#### **4.1 RJSeal™ Testing**

To date the comparison of the asphalt treated with RJSeal™ has been compared on a subjective basis over a very short period at the test site on XiShanBei Airport.

Testing equipment will be brought to the site for comparison on a more disciplined, objective basis in the future, and to this end, the following tests will be undertaken.

- Fuel Resistance Comparison
- Elasticity/Ductility Testing

#### **4.2 Water Penetration**

Prior to the application of RJSeal™ the demonstration sections were checked for water penetration using test equipment as shown in Figure 4.5, which follows. The demonstration section will be checked again, approximately one month following the RJSeal™ application to confirm that water penetration is reduced.

#### **4.3 Fuel Resistance Comparison**

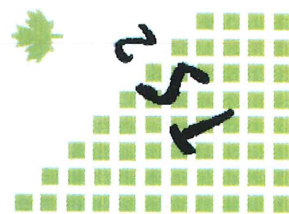
Fuel Resistance Comparison will be undertaken on several sections of the untreated and RJSeal™ treated sections in close proximity to the Outflow meter tests in the near future. This comparison will consist of pouring about a cupful of diesel fuel onto the road surface and then later checking the penetration of the fuel. If the fuel readily penetrated the asphalt pavement surface, then resistance to this form of chemical attack was presumed to be lower than if the fuel pooled on the surface of the asphalt pavement and slowly evaporated.

#### **4.4 Elasticity/Ductility Testing**

This aspect of the testing is beyond the capabilities of the field equipment available to both Crown Capital Enterprise Limited and RJSeal™ personnel and as such, experts from the Peoples Liberation Army in the field of asphalt testing will undertake this work. To-date, core samples were acquired prior to the application of RJSeal™ and further core samples are scheduled to be acquired one month after the application, sometime in mid-September. See figure 4.4, showing the initial core sample acquisition work.



Figure 4.5 Water Penetration Test



## **5.0 Test Completion Schedule**

Technicians from the Peoples Liberation Army will be dispatched to undertake further testing on the trial section in the near future. The projected completion of this testing is scheduled as shown in the following chart.

ID	Task Name	Duration	Start	Quarter	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1	Travel to BaoDing for presentation	1d	Thu 5/29/03	3rd Quarter																
2	Hiatus	48d	Fri 5/30/03	3rd Quarter																
3	Demonstration Section - XishanBei Airport	2d	Wed 8/6/03	3rd Quarter																
4	Hiatus	2d	Fri 8/8/03	3rd Quarter																
5	Demonstration Section - XishanBei Airport	1d	Sun 8/10/03	3rd Quarter																
6	Hiatus	20d	Mon 8/11/03	3rd Quarter																
7	Prepare draft report on RejuvaSeal Demo and Testi	10d	Mon 9/8/03	3rd Quarter																
8	Testing by PLA, Technical Department	20d	Mon 9/8/03	3rd Quarter																
9	Hiatus	20d	Mon 10/6/03	3rd Quarter																
10	Prepare final report	5d	Mon 11/3/03	3rd Quarter																
11	Submit final report	1d	Mon 11/10/03	3rd Quarter																

Project: XiShanBeisched Date: Sat 10/4/03	Task	Summary	Rolled Up Progress
	Progress	Rolled Up Task	
	Milestone	Rolled Up Milestone	
Page 1			

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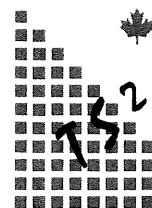
## **WANCHAI, HONG KONG**

### **Demonstration of Rejuvaseal™ XiShanBei Airport, XiShan, Hebei, Peoples Republic of China**

**August 2003**

## **APPENDICES**

<b>No.</b>	<b>Description</b>
A	Rejuvaseal™ – Technical Seminar, Shanghai, China, August 2001
B	Rejuvaseal™ Descriptive Literature
C	Desco D200 Sprayer – Technical Specifications



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Lamma, Hong Kong**



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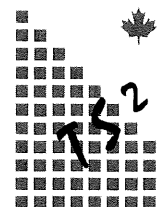
**WANCHAI, HONG KONG**

**Demonstration of Rejuvaseal™  
XiShanBei Airport, XiShan, Hebei,  
Peoples Republic of China**

**August 2003**

**Appendix A**

**Rejuvaseal™ – Technical Seminar,  
Shanghai,  
Peoples Republic of China,  
August 2001**



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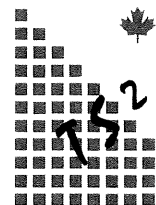
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XiShanBei Airport, XiShan, Hebei,  
Peoples Republic of China**

**August 2003**

**Appendix B**

**Rejuvaseal™ Descriptive Literature**



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**WANCHAI, HONG KONG**

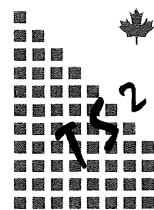
**Demonstration of Rejuvaseal™  
XiShanBei Airport, XiShan, Hebei,  
Peoples Republic of China**

**August 2003**

**Appendix C**

**Desco D200 Sprayer**

**Technical Specifications**



**TS² Consulting Inc.  
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